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MYSORE 1949

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A Review of Forestry and Forest Products

July-August 1949 **Vol. III, No. 4**

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The Honorable Shri Jairamdas Daulatram, Minister for Food and Agriculture, Government of India, inaugurates the International Forestry and Timber Utilization Conference at Mysore.

The Way Ahead

"I FEEL like a guest after the wedding ceremony is over," said Chairman Sir T. Vijayaraghavachariar, in his closing address at the Mysore Conference. The delegates put this sentiment into different words, but all were agreed that this International Forestry and Timber Utilization Conference for Asia and the Pacific was an essential first step: it had laid the foundations for future harmonious work together.

The Conference, sponsored by FAO, was held in Mysore, India, from 28 March to 8 April. Ten countries of the region were officially represented. Five other countries and two international organizations sent observers.

This was the first intergovernmental meeting ever held to consider the especial forestry problems of Asia and the Pacific, and, before adjourning, the delegates agreed that each delegation should bring the Conference report and recommendations to the prompt attention of its government. The delegates also recorded the declaration "that any failure by a government to accord due recognition to the great value of forest resources will have disastrous consequences for the economy of the country."

The governments of all the countries of the region were urged to join in forming a Forestry and Forest Products Commission for Asia and the Pacific. The commission should consist of accredited representatives of all interested countries, and it should meet as and when necessary (1) to co-ordinate matters of common interest to the region; (2) to examine particular problems in the fields of forestry and forest products, both of immediate urgency and long-term significance; and (3) to make recommendations to governments through the Council of FAO.

The Conference also recommended that the Director-General of FAO set up a forestry and forest products working group in the region, to be composed of staff members of the Organization's Division of Forestry and Forest Products. The primary task assigned to this working group should be to press for the adoption by governments of the appropriate recommendations of the Conference.

The Conference emphasized the importance of forestry in raising living standards, noting that "In any program designed to substitute abundance for scarcity, forests and the practice of forestry must play a key role." A resolution urged governments "so to manage their forests as to serve rural and urban populations and thus enlist the support of the masses for the implementation of a sound policy for the protection and development of forests."

Recommendations of the Conference centered on two general topics: conserving resources for present inhabitants and for posterity, and meeting immediate wood consumption needs.

Conserving Resources

Three of the vital resources of nature — the forests themselves, soil, and water — are protected by good forestry practices or are wasted by poor usage. In the words of the Conference, "The wasting away of the soil through erosion is one of the most alarming problems in many countries of the region. It is a menace which threatens the welfare of millions of people and which requires urgent nationwide and indeed international effort to combat its dangers."

The Conference stressed the disastrous results of erosion — the decrease in soil productivity; the precipitation of waters into streams and streams into all-too-frequent floods which, depositing sand and silt,

wreck irrigation works, impair the usefulness of reservoirs, and reduce the navigability of rivers; the lowering of the water table and lessening of surface water supplies generally for irrigation purposes.

To help fight the menace of erosion the Conference urged each government of the region to set up a central authority to co-ordinate the planning and execution of land utilization and soil conservation measures. It suggested the enaction of appropriate legislation to provide for powers to control land use and enforce the observance of soil conservation measures and sound forestry practices on all lands, both state and private, where they are needed. It advocated setting up demonstration areas for the dual purpose of educating the public in the advantages of soil conservation and good forest management and of providing practical training for technical staffs.

Where conservation in the headwaters of great rivers is a matter of common concern to several countries, the Conference urged those countries to combine their efforts and to agree upon practical measures for the solution of their common problems.

Wood Consumption Needs

The fact that fuelwood and building materials are the forest products most urgently needed in the region today was stressed by the Conference. Lack of fuelwood and charcoal in some parts of the region has resulted in enforced use of dried animal dung as fuel, thus robbing the land of critically needed fertilizer. Lack of an adequate and cheap supply of sawn timber, poles, and other building materials is lowering the standard of living of many Asian peoples, impeding postwar reconstruction, and adversely affecting the housing of displaced persons.

With these urgent needs in mind, the Conference agreed that in the "deficit" countries immediate steps must be taken to increase the establishment of village fuelwood reserves of quick-growing species and that small holders must be encouraged to set aside at least a small part of their land for growing fuelwood, poles, and timber. As it was stated by the Conference, "The urgency of this problem must continually be brought to the notice of governments, because failure to find a solution may have serious repercussions on social life and on agriculture."

The Conference suggested that the governments help to increase fuelwood and charcoal supplies by subsidizing transport from areas of surplus production to areas of acute scarcity; by installing modern charcoal kilns to reduce waste to a minimum; by passing and enforcing legislation requiring sound management of privately-owned woodlands, and, where such woodlands are not already being worked for the benefit of the community as a whole, by assuming responsibility for their proper management; and by afforestation schemes, such as planting fast-growing species on all suitable state lands, including, where feasible, strips bordering canals, roads, and railways.

There is also a marked shortage of sawn timber, building materials, and forest products of all other kinds, and, as the Conference pointed out, "Purchasing power is generally low and does not permit of a consumption rate per person which is compatible with a reasonable standard of living. Production is not at present sufficiently great to provide forest products at prices within the means of the vast masses of the population." Reasons for this inadequate production are considered to be: (1) harvesting and utilization of only a few favored species; (2) inadequate attention, in some countries, to efficient silvicultural treatment; (3) incomplete utilization, both in the forest and in the process of conversion, of such species as are being harvested; and (4) lack of modern extraction and milling facilities and lack of adequate communications and transport.

Governments were asked by the Conference to draw up specific lists of their requirements in forestry equipment and logging and milling machinery, and to apprise FAO of their requirements. FAO was asked to review the timber import requirements and export availabilities of the various countries in the region with a view to arriving at a reasonable balance between over-all demand and supplies. It was agreed by the Conference that trade policies of some countries need overhauling, and that trade promotion should be pushed forward by governments with vigor and farsightedness.

Long-Term Implications

The solution of the region's two outstanding problems of immediate urgency — conserving natural resources and supplying domestic needs for fuelwood and building materials — also have long-term implications, the Conference believed. It summed up the measures to be taken in combating these problems: "Bold schemes of protection and reforestation of the headwaters of great rivers are needed — projects to combat soil erosion, programs of afforestation, and measures to effect flood control. Only thus can food production and agriculture be made secure, water supplies be safeguarded, and living conditions be ameliorated. . . . An international approach is necessary.

"Countries . . . also need to accept and adopt new concepts of utilization of forest resources, and to secure intensive output of forest products by means of integrated industries. Traditional methods of management certainly have their place, but research and scientific progress offer new horizons to the forester. Forestry and silviculture are not ends in themselves but only means to produce, on a sustained yield basis, the kinds and quantities of forest products needed by the people, by industry, and by trade.

"The Conference urges all countries, even at this time of economic and political stress, to draw up well-considered plans for the conservation, expansion, and development of their forests."

At the final plenary session, Marcel Leloup, Director of the Forestry and Forest Products Division and personal representative of Mr. Norris E. Dodd, Director-General of FAO, concluded, "I would ask you not to forget that you have only agreed to a program of work. You have recognized the difficulties and you have also decided on practical solutions. But it is now that the work starts. It is now through our mutual attack on these problems that the real fruit of this Conference will be borne. It is now your task to carry out what you have decided should be done. FAO will gladly take up its share in the tasks you have set. Working together, I feel sure that our objectives will, in the words of our venerable Chairman, Sir T. V., be 'harmoniously consummated'."

Cheluvamba Mansion, location for the Conference.

Mysore, 1949

The International Forestry and Timber Utilization Conference for Asia and the Pacific was held in the Cheluvamba Mansion at Mysore City, India, 28 March to 8 April 1949.

The Government of India and His Highness the Maharaja of Mysore State were hosts to this FAO-sponsored Conference, the first to be held on forestry and forest products problems in Asia and the Pacific. Member governments officially represented by delegates were: Burma, Ceylon, France, India, the Netherlands, New Zealand, Pakistan, the Philippine Republic, Siam,* and the United Kingdom. Australia and China were unfortunately not represented. Five other countries — the Republic of Indonesia, Korea, Nepal, Portugal, and SCAP-Japan — sent observers, as also did two international organizations, UNESCO and the International Meteorological Organization.

Shri Jairamdas Daulatram, Minister of Food and Agriculture, Government of India, representing Prime Minister Pandit Nehru, inaugurated the Conference. His Highness Shri Jayachamarajendra Wadiyar Bahadur, Maharaja of Mysore, warmly welcomed the delegates, and a message to the Conference from the Prime Minister was read by Shri K. L. Panjabi, Secretary, Ministry of Agriculture.

Minister Daulatram then addressed the Conference, emphasizing the intimate relationship between forestry, agriculture, and soil and water conservation. "It is," he said, "in a way in the fitness of things that the first Regional Conference on Forestry should be held in India. Forests have played a part in the social and spiritual life of our country which they may not have played elsewhere. Wise men in India did not look upon forests simply as an unwanted waste of land which man could put to better use or as the abode of wild and untamed lives hostile to human peace and welfare. In the eyes of India's sages forests had a great place in the life of man. They could serve his spiritual needs also. It is in the forests more than in the field that man is brought close to nature. Out of that close contact emerges a balanced judgment on the varieties of human life, and one is better able to fix man's place in nature and the place of forests in the evolution and progress of human society. And so it was in the retirement of the forest that the great seekers of truth found the truth and sang and spoke about it till it has come down to India's present generation through the sacred books of this country.

"Today, however, forests have ceased to have any spiritual inspiration or message. They are the means of our physical welfare through their effect on climate, agriculture, and industry. But even that role man has not permitted forests to play. In almost every country and more so in the countries of the East there has been a progressive denudation of the forests, and to that extent our soil has lost its structural guardian. The erosion of the top soil has become a grave danger to agricultural production for meeting the needs of growing populations. Half of the population of the world crowds upon the fields of Asia; and more and more of the forest area is encroached upon to enable man to feed himself, and his crops go on pushing the trees out. The soil thus becomes more and more subject to erosion.

"In our own country the problem is no less grave than anywhere else and it needs to be handled on a national basis and with maximum interprovincial and state co-ordination. I realize that in India as elsewhere this cannot be a short-term program. Our country has resolved to achieve freedom from imports of foodgrains by the end of 1951. The provinces and states are being approached to join in attaining this object of supreme national urgency. Though we are planning to concentrate on intensive cultivation with better use of water, manure, and seeds, it would be unwise not to design the nation's program of soil conservation for simultaneous implementation.

"You who are gathered together are men of experience and learning, and I would welcome it as a fruitful result of the Conference if your decisions laid full emphasis on the framing of urgent plans for a rational integration of forest and agricultural policy so as to save our soil from progressive impoverishment.

"No instance can be more striking from this point of view than the present position of fuelwood for the villager's home. Denied proper facilities in this respect, he encroaches upon the food which the land

*Since then Siam has become officially known as the Kingdom of Thailand, as of 11 May 1949.

badly needs, and uses the manure as fuel. He forces himself into the vicious circle of less manure and less yield. An effective program for rapid increase in fuelwood for the rural masses which can be reconciled with a rational policy of forest development would be a blessing for the agriculturist in most Asiatic countries.

"But while deliberating upon the measures of service to the rural masses or city industries, the experts and specialists in forestry from the countries of Asia come close to each other, forgetting for the moment their distinctive nationalities, and are bound together by the strong ties which common research into nature's secrets and common aims to serve humanity naturally create. The bond of science and the brotherhood in service bridge all international gulfs and create a sense of fellowship, a spirit of human kinship, and a feeling of cultural identity which I feel is at the present moment a greater contribution of such international conferences than even the concrete economic result which must inherently result from your deliberations. India is only too anxious to help in forging such cultural links. It was our great teacher and leader, Mahatma Gandhi, who preached the identity of man, be his color or creed what it may, and it is in that spirit that India should and would participate in conferences like yours of today."

The Secretary-General then read a message from Mr. Norris E. Dodd, Director-General of FAO, expressing the hope that this Conference, like meetings in the other fields of FAO's activity which had been organized in Asia for 1949, would further illustrate how the well-being of people depends on the well-being of the land and its vegetation, and especially on the use that is made of the land and its vegetation. Healthy forests on the hills, wisely handled, mean irrigation water in the valleys for rice and other foods, clear streams and regular supplies of drinking water, and uniform water-flow for river transport and in some places for hydroelectric power, Mr. Dodd pointed out. The forest produce itself means fuelwood for cooking; lumber, bamboo, and plywood for houses; and paper for books and newspapers. Forests can and do mean employment for large numbers of people in logging, in sawmilling, in tree planting and tending. In short, the forests mean life.

The objectives of the Conference, Mr. Dodd considered, could be met through the application of modern scientific knowledge, acquired through research and disseminated by technicians. Such application can be given meaning only by governmental action, through legislation, through budgetary provisions, forest services, adequate staff and modern facilities, and through continuity of interest. Without such administration, the decisions of delegates would remain only on paper. Forest services, as governmental agencies, must depend not only on the sympathetic comprehension of presidents, ministers, and civil servants, however, but on the people's understanding of their own responsibilities in the proper husbandry of land and forests, and of the benefits they might obtain. Mr. Dodd hoped that this Conference would stimulate action by individual governments and joint efforts by all the governments in the region.

As Mr. Dodd's personal representative to the Conference, Mr. Marcel Leloup, Director of FAO's Division of Forestry and Forest Products, listed in his opening speech "many factors which if properly utilized can help a great deal in meeting the problems before us. First of all, there exists in this region a large group of experienced foresters, whose many years of work have already produced partial solutions on a small scale within their countries. Such solutions may well point the way, if applied on a large scale, toward meeting the needs of their own and of neighboring countries. We have a large fund of knowledge on methods of reforestation, after many years of experience, in several countries in the region. We know of the excellent results obtained in the management of teak forests in Burma, Indonesia, and other countries. We know that considerable progress has been made in forest management methods for the rain forest dipterocarps. And we know also of the work done in fuelwood reserves for local village use, for example, in India and Burma. We have available to us methods of soil erosion control that have been very successfully demonstrated in several parts of the region.

"We can point with pride to the outstanding research institutions at Dehra Dun, Kuala Lumpur, at Buitenzorg, at Melbourne, and in several parts of Japan. It is especially heartening to know of the functioning of the fine professional forestry schools and also of the ranger-grade schools.

"With regard to legislation, the basic principles have been adopted in almost all countries, and in certain countries such laws have attained a high degree of development.

"In the field of utilization we can point to needs for modernizing logging and sawmilling operations but at the same time we can learn from progress already being made in these fields in certain countries in the region. The use of efficient sawmill machinery has proved highly profitable in those parts of the region where it has been tried, and the problem of training woods and mill labor in the use of modern machinery in these countries has not proved as formidable as some had expected."

Mr. Leloup hoped that delegates would keep before

To the right of His Highness the Maharaja of Mysore, the Honorable Minister for Food and Agriculture, Government of India, consults with the Secretary-General, Dr. M. A. Huberman of FAO at the opening session of the Conference.

them in their deliberations (1) the picture of the tremendous human resources in the countries represented here; (2) the growing needs of these ever-increasing millions of people for such things as fuelwood and lumber in particular, which must be met if this human resource, so to speak, is to make its maximum contribution to the welfare of Asia and of the world; (3) the fact that these needs must be largely met through the rational exploitation of previously undeveloped timber resources; and (4) the fact that land which has been almost ruined by the abuses of overcutting, overgrazing, repeated burning, and roving agriculture in the past must be restored to productivity through large-scale conservation programs of reforestation, erosion control projects, and flood prevention measures. "If we are successful in this," he said, "we shall, by adding our concern for coming generations to the traditional respect for past generations, have contributed to the welfare of Asia's peoples and of peoples everywhere."

The delegates, in giving the greetings of their respective governments, expressed the strong desire that the Conference produce concrete recommendations for the solution of the numerous serious problems facing the countries in the region.

The final item of business of the first plenary session was the election of the permanent chairman. The head of the Indian delegation, Sir T. Vijayaraghavachariar, formerly Vice-chairman, Imperial Council of Agricultural Research of the Government of India, was unanimously elected.

A Steering Committee consisting of the heads of all delegations met early on the second day to examine credentials, consider rules of procedure, nominate a slate of officers, and finalize the agenda, which had been drawn up in draft by FAO. At the second plenary session the Conference adopted the recommendations of the Steering Committee in these matters without division.

Delegates elected to fill offices were as follows:

First Vice-chairman:	Y. S. Ahmad (Pakistan)
Second Vice-chairman:	F. Tamesis (Philippine Republic)
Third Vice-chairman	Tan Chein Hoe (Burma)
First Rapporteur:	Mom Chao Subsuekhswasti Suekhswasti (Siam)
Second Rapporteur:	J. P. Edwards (United Kingdom)

In view of the despatch with which agreement was obtained on all business matters, the Chairman adjourned the second plenary session and, after a brief intermission, opened the first general session so that the delegates could begin consideration of the items included in the agenda adopted for the Conference deliberations. This agenda provided for discussion of the following items:

A. *Immediate Measures*
1. Provision for local needs:
   (a) Fuel
   (b) Lumber and other products
2. Expansion of production and distribution of lumber and building materials:
   (a) Immediate possibilities and problems
   (b) Grades, specifications, timber-testing methods
   (c) Planned utilization of structural timber and bamboo
   (d) Logging, milling, and road construction machinery
3. Needs for trained foresters in the next 5 years, schools, and immediate exchange of students and technicians
4. Recognition by governments of importance of forest resources

Pakistan's delegation consisted of A. Rahim, Chief Conservator of Forests of Sind, (left) and Y. S. Ahmad, Conservator of Forests of Bengal, who was First Vice-Chairman of the Conference, as well as Chairman of the Drafting Committee.

B. *Protection and development of resources*
5. Large-scale conservation programs:
   (a) Erosion control, watershed protection, flood prevention
   (b) Control of grazing, fire, insects, disease
   (c) Substitutes for roving agriculture
   (d) Game and wild-life management
6. Reforestation and afforestation
7. Formulation and review of policy, legislation, and organization
8. Research and exchange of professional information

C. *Industrialization*
9. Raw material supply and modern inventory methods
10. Trends in requirements, production, distribution, and statistical analysis
11. Integration and modernization of forest industries
12. Capital requirements
13. Labor standards; working and living conditions
14. Trade policies, including trade promotion in consumer countries

Each item was introduced through the medium of a paper previously prepared by individual delegates and distributed to all present at the meeting. In this way, discussion proceeded without delay. At the close of each morning session, working groups were appointed to meet in the afternoon to summarize the discussions, define the problem, and draft recommendations on particular groups of agenda items. After all the items of the agenda had been disposed of under this procedure, a drafting committee, under the leadership of Y. S. Ahmad of Pakistan, co-ordinated the results and produced a first text of the Conference report.

This report selected the high lights of the deliberations, described the outstanding problems, and embodied the various resolutions which had been put forward. At the third plenary session on 7 April, this

draft was considered paragraph by paragraph and resolution by resolution by the Conference. Only minor alterations were introduced and on only one point was a decision referred to the vote of the Conference.

At the final plenary session on 8 April, on the motion of Mom Chao Subsuekhswasti Suekhswasti of Siam, the amended report* was unanimously approved and adopted in its entirety. The officers of the Conference then signed the report for the delegates, and Mr. Leloup and the Secretary-General signed it on behalf of the Director-General of FAO.

The meetings resulted in a most useful exchange of ideas and experience, and all delegations expressed thanks to the Government of India and the State of Mysore for having made the Conference possible. As a reward for their arduous labors, the delegates were entertained at receptions given by the Government of India, by His Highness the Maharaja of Mysore, by the Pakistan Delegation, and by Mr. Leloup on behalf of the Director-General of FAO. His Highness also arranged for the delegates to see the palaces, the brilliant illuminations in Mysore and the lighted fountains of the Brindavan Gardens, the elephant stables, the Technical Institute exhibitions, and the museums of Mysore, which has always been noted as one of the most progressive Indian states. The Chief Conservator of Forests of Mysore kindly arranged for visits to, among other things, the forest plantations on Chamundi Hill, government furniture and sandal-oil factories, irrigated fuelwood plantations of *Casuarina* and *Eucalyptus*, and the Jog Waterfalls and the Wildlife Sanctuary at Bandipur, where visitors saw in their natural surroundings spotted deer, sambhur, wild dogs, and a magnificent herd of bison. The Mysore Plywood Corporation conducted delegates through their very modern plywood plant at Bangalore. For the more rugged, special trips were arranged for mahseer fishing and crocodile shooting.

Films were shown on three evenings, and the delegates agreed that the FAO productions of "Green Gold" and "Battle for Bread" were outstanding among them. Arrangements are being made for loans of these and other pictures in the several countries.†

An atmosphere of understanding and accord permeated the entire Conference, and the enthusiasm for working together in the future was movingly expressed by an observer from a nonmember government in the following words: "I promise that before the next Conference my country will improve its work in forest research, administration, and education, so that I can bring you good reports, not as an observer from a nonmember government, but as a full-fledged delegate from a member government of FAO."

*Report of the Forestry and Timber Utilization Conference for Asia and the Pacific—Mysore, India, 28 March-8 April 1949.

†United Nations films are available from:

Burma: Ministry of Information Secretariat, Rangoon

France: Information Centre, 19 Avenue Kleber, Paris

Netherlands: Certain titles available in Dutch through French Information Centre, given due notice

New Zealand: New Zealand Film Library, 96 The Terrace, Wellington

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Philippines: Dept. of Foreign Affairs, U.N.A., Manila

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United Kingdom: Information Centre, Russell Square, London

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Portugal: Not available at present—inquiries to Geneva Information Office, Palais des Nations, Geneva, Switzerland

Japan: U.S. Civil Affairs Division, U.S. Dept. of State, Washington, D. C.

Officers and delegates before the Cheluvamba Mansion.

Forest Resources—Far Eastern and Pacific Regions

By the Staff of FAO's Division of Forestry and Forest Products

DURING the summer of 1948 FAO published the results of its first systematic inquiry regarding forest resources under the title "Forest Resources of the World." Information in this report was obtained through a special forest inventory questionnaire sent by the Director-General to all governments.

The information relating to forested areas, recomputed from a continental to a regional basis, is summarized in Tables 1 and 2. Areas in these tables are expressed in millions of hectares so that the relative situations in different countries may be grasped easily. This arrangement admittedly precludes statement of areas of less than one-half million hectares, which may be of considerable relative importance in certain countries, but more complete data can be obtained from the world report.

As was to be expected, the forest inventory inquiry revealed great differences in the completeness and precision of information respecting forest resources in different countries. Some countries felt that they were not yet in a position to reply to the questionnaire at all, and others were able to answer only in part. Thus it is evident that the information we now have is not final and that much of it will be subject to revision when the next inquiry is undertaken. Nevertheless, the present information is believed to be more complete and more consistent than any that has previously been available. It is hoped that all countries will be able to improve their knowledge of the extent and potential productivity of their forest resources in the near future, and FAO will be glad to furnish or secure advice regarding inventory methods for countries that desire it.

The tables show that 24 percent of the total land area of the Far Eastern region and 19 percent of the Pacific region is occupied by forests. In each case only about two-thirds of the total forested area is classed as productive forest; that is to say, forest capable of yielding regular crops of forest products under sustained-yield management. The remaining forest areas, classed as "other forests," include lands which are occupied by trees but which are incapable of systematic forest management because the conditions of site and climate are so severe and tree growth so poor. In the Far East the average area of productive forest per inhabitant is estimated to be 0.3 hectares, but in the Pacific region the corresponding figure is 4.2 hectares. In both regions roughly one-half of the productive forest area is classed as inaccessible.

These regional averages are interesting as a basis for comparison with other regions of the world; but reference to the tables will show that they conceal wide variations between countries within the regions. Particularly in the Far East, some countries possess relatively large forest resources in comparison with their populations while others have very little. Hence it appears that one of the most important problems in Asia is to determine the extent to which well-forested countries of the region can supplement the limited supplies of forest products available to the people of less fortunate countries. In the long run, the large populations of China and India are likely to provide an almost limitless market for forest products.

In the Pacific region all the reporting countries have relatively large areas of productive forest per inhabitant, although both total population and total forest area are small as compared with other forest regions. The two larger countries, Australia and New Zealand, have been importers of forest products; but the extent of their resources seems favorable to the eventual establishment of a relatively high degree of self-sufficiency and, in the case of New Zealand, to the early possibility of exportable softwood supplies.

The productive forests which consist of coniferous species are 22 percent of the total in the Far East and 16 percent in the Pacific. These proportions are much higher than in Latin America, but much lower than in Europe and North America. For use as fuelwood, broadleaved species are usually more acceptable than conifers, but for industrial purposes the demand for coniferous species has greatly exceeded that for broadleaved species. Thus it may be anticipated that further development of industrialization in the Far East and the Pacific will require adaptation of broadleaved woods to purposes for which conifers are preferred in the North Temperate Zone. The alternative will be the extension of coniferous forests by planting.*

To sum up, available information indicates that in China and India there is great need for extending forested areas by artificial means, primarily to increase supplies of fuelwood but also to provide building timber and wood for industrial use. Also, productive forests now classed as inaccessible should be opened up and placed under management as rapidly as economic conditions permit. Most of the remaining countries of Asia are relatively well forested, but large areas of forest have not yet been developed and, consequently, are as yet making little or no contribution to human welfare. In the Pacific region the principal forestry problems are centered in the industrialized countries, Australia and New Zealand, but the extent of existing resources indicates that these problems can be solved by improvements in forest management.

*Note: For information on the production, trade, and consumption of forest products, see the FAO *Yearbook of Forest Products Statistics, 1948*.

TABLE 1. FOREST RESOURCES RELATIVE TO POPULATION AND LAND AREA, FAR EAST AND PACIFIC REGIONS

Country	Population	Total land area	Productive forests	Other forests	All forests: Area	All forests: Percentage of total area	Productive forest area per caput
	(*Millions*)	(*Million hectares*)				(*Percent*)	(*Hectares*)
Far East							
North Borneo and Brunei	0.4	8	1	5	6	82	2.6
Burma	17	68	25	14	39	58	1.5
Ceylon	7	7	1	3	4	55	0.2
China	456	944	56	27	83	9	0.1
India and Pakistan[1]	311	222	33	11	44	20	0.1
Japan	75	37	22		22	59	0.3
Malaya	6	13	7	3	10	77	1.2
Indonesia	75	190	70	50	120	63	0.9
Philippines	19	30	13	4	17	59	0.7
Sarawak	1	12	4	7	11	89	7.8
Siam	18	51	33		33	63	1.8
Total, Reporting Countries	985	1,582	265	124	389	25	0.3
Total, Nonreporting Countries	167	450	70	30	100	22	0.4
TOTAL, FAR EAST	1,152	2,032	335	154	489	24	0.3
Pacific							
Australia	7.5	770	20	11	31	4	2.7
Fiji Islands	0.3	2	1		1	52	3.2
Hawaii	0.5	2	1		1	46	1.6
New Caledonia	0.1	2				4	1.3
New Zealand	1.8	26	2	5	7	26	1.1
Total, Reporting Countries	10	802	24	16	40	5	2.4
Total, Nonreporting Countries	2	53	26	14	40	76	13.0
TOTAL, PACIFIC	12	855	50	30	80	9	4.2
TOTAL, FAR EAST AND PACIFIC	1,164	2,887	385	184	569	19	0.3

[1]1938, estimated for areas formerly included in British India only.

— None, or less than 500,000 hectares.

TABLE 2. FOREST RESOURCES: CLASSIFICATION OF PRODUCTIVE FORESTS, FAR EAST AND PACIFIC REGIONS

Country	Accessible forests: Conifers	Accessible forests: Broadleaved	Accessible forests: Total	Inaccessible forests: Conifers	Inaccessible forests: Broadleaved	Inaccessible forests: Total
			(*Million hectares*)			
Far East						
North Borneo and Brunei				—	1	1
Burma		25	25			
Ceylon		1	1			
China	14	3	17	35	4	39
India and Pakistan[1]	3	30	33	—	—	—
Japan	8	12	20	1	1	2
Malaya	—	2	2	—	5	5
Indonesia	—	11	11	—	59	59
Sarawak	—	4	4	—	—	—
Siam	—	11	11	—	22	22
Total, Reporting Countries	25	99	124	36	92	128
Total, Nonreporting Countries	6	34	40	6	37	43
TOTAL, FAR EAST	31	133	164	42	129	171
Pacific						
Australia	1	12	13	—	7	7
Fiji Islands		1	1			
Hawaii		1	1			
New Caledonia				—	—	—
New Zealand	1		1	—	1	1
Total, Reporting Countries	2	14	16	—	8	8
Total, Nonreporting Countries	2	6	8	4	14	18
Total, Pacific	4	20	24	4	22	26
TOTAL, FAR EAST AND PACIFIC	35	153	188	46	151	197

[1]Estimates for areas formerly included in British India only.

— None, or less than 500,000 hectares.

Provision for Local Needs

By SHRI G. B. BAKSHI, Indian Forest Service, Chief Conservator of Forests, Central Provinces and Berar

AT THE DAWN of civilization, the greater part of the habitable globe was covered by dense forests. A meager population wandered in these gigantic primeval forests, on which they were dependent for all the necessities of their existence. The forest was their home and the trees were their gods. As population increased and modern society began to evolve, man started an agricultural and pastoral existence, clearing the land in ever-widening zones for habitation, cultivation, and grazing. The first great onslaught on virgin forest lands thus commenced. It has been a long-sustained attack, which still continues with accelerated fury in many parts of the world. The destruction of forests, however, has not been uniform, but has varied directly with the stage of civilization reached and the special circumstances obtaining in each region. Britain and Germany found their forests very helpful as an impenetrable barrier against the mighty arms of Imperial Rome, while Greece and Rome had largely converted their forests into cultivation and the still older civilizations of the Near East had already largely destroyed the vestiges of their forests. In China and India, all forests within the zone selected for settlement and cultivation were cleared of virgin forests.

Today the world's people depend in overwhelming proportion on agriculture for their maintenance, and one of the most important functions of forest management is to meet the requirements of this agricultural population. Forestry is well recognized as the handmaiden of agriculture. The peasant looks to the forests to supply some of his most vital needs — fuelwood, small timber for houses, and wood for implements, as well as grazing and fodder for his cattle. But man's needs for forests do not end with these primary necessities of life. Modern civilization is largely dependent on forest products and other resources obtained from forest areas. A definite minimum area of forest lands, therefore, is an economic and physical necessity for the well-being of every civilized nation.

In order to appreciate fully this question of ever-increasing local needs for fuel, timber, and other forest products, every administrative unit should be, if feasible, divided into three zones, depending on the relative accessibility of the forests in that unit to the local population and the availability of the necessary supplies from the forests.

Forest Communities

Residing within the very heart of the forests are small pastoral units still clinging to their traditional environment and depending almost entirely on the forest resources for their bare necessities of life. These are a fast decaying race and unless their requirements are considered sympathetically and they are gradually given helpful facilities to develop their precarious sources of livelihood, it can be assumed that their days are numbered. The forests give them some edible fruits, flowers, and roots, supply some herbs of medicinal value, and provide light and heat for their homes. All these supplies are essential, and on the successful arangements made for them depend the welfare and even the very existence of a large population. In wooded surroundings, supplies of such essential forest produce hardly present any perplexing problem. The people collect their own modest requirements, and so long as they do not behave in a way prejudicial to the forests on which they depend for their necessities of life, they need not be interfered with. Unfortunately, however, the economic outlook of these people is incompatible with social progress and prejudicial to the main concepts governing sound forest management. As already indicated, the supplies of forest produce for their bare existence are not regulated; but since their needs are comparatively few in extent and character, this lack of regulation may not in itself offer any serious handicap to forest conservation. But associated with this unregulated demand for forest produce is their present practice of cultivating forest lands in a cycle, with the most primitive implements and methods. Vast areas of forest land are systematically felled and thoroughly burned every year for cultivation by them in their own way. A thorough burn gives them all the wood ash they require as fertilizer for growing their crops. They dibble in the seed by the stump side and materially economize in the use of seeds for cultivation. They cultivate a chosen area for a few years, and when its fertility has been completely exhausted, they move on to the next area. After a few years of rest, the first area is again restocked with vegetative growth, and as soon as the growing stock reaches a sizable dimension it is again felled and burned and the area is then cultivated again. It can hardly be overemphasized that this rotating shifting cultivation, which is practiced throughout Southeast Asia, is a negation of sound forestry.

In considering this matter, it should be realized that these tribesmen are not conversant with modern methods of agriculture and that their financial resources are too slender to meet the necessary cost of cultivation on improved lines. An attempt should be made in Southeast Asia, therefore, to wean the aboriginal away from this very harmful practice of shifting cultivation through a benevolent policy of substantial grants of seeds, fertilizers, and other equipment.

Communities Adjacent to Forests

The zone which lies close to the main areas of forests is mainly agricultural, and the needs of the population for forest products generally present no serious problem. The village consumers require small timber, firewood, grass, grazing, thorns and other fencing material, edible fruits and leaves, flosses and fibers for their limited needs. To enable them to sustain and im-

prove their cultivation, the prices for all such supplies should be well within their capacity to pay.

Satisfactory though the position generally is, however, the question arises whether these supplies should not be correlated with the supplies that normally become available in any particular tract. With the continued pressure from an ever-increasing population and increasing livestock numbers, some of the forest areas adjoining the cultivated tracts are being denuded very rapidly and are showing signs of exhaustion. Although this problem is of comparatively local importance, it raises the important issue whether such supplies can be continued at a rate definitely prejudicial to the interests of sound silviculture. In such areas, presumably, the present supplies of all forest produce should be brought into conformity with the present resources of the adjoining forests. The rights and privileges of users and the grazing of cattle in forest areas should be permitted only to the extent that the forests can stand. In tropical or subtropical regions the rainfall is commonly restricted mainly to a particular season, and any misuse or unduly large-scale use of forests will lead to deterioration and should, therefore, be discouraged. The daily grazing of ever-increasing herds of cattle within a limited area of forest presents a serious problem in all forest areas within easy reach of a well-cultivated tract. As a comparatively large herd of cattle uses the same area almost daily in search of fodder which has sometimes disappeared or is fast disappearing, extensive damage to the forest growth is likely to occur and may progressively render the area unproductive. It is necessary, therefore, to restrict daily grazing to the rate that the land can support and to provide for fodder by other methods.

The provision of an unregulated supply of [illegible] wood in bulk from any tract, however well-[illegible] might be, is also likely to result in gradual deg[illegible] tion of these forests. The factors governing growth or regrowth in a particular tract should be carefully considered, and supplies and restocking should be correlated in order to avoid any undue depletion of the growing stock.

There are, however, a very large number of village consumers living in extensively cultivated and thickly populated areas whose demands for fuelwood, grass and other forest produce are most insufficiently supplied at present. The drift of population from undeveloped tracts with marginal lands to areas with fertile soil and more of the amenities of life is natural and can readily be understood. It must, however, be conceded that the system of land use in force has failed to hold the population to more remote parts of the country. Roads, schools, and other facilities may help to reattract men and their families to these parts, and concentrated efforts should be made to develop such areas in this way.

Pressure for fuelwood in India has forced villagers to hack at what might otherwise have been a valuable teak plantation.

Communities in Areas Denuded of Forests

The supply of forest products for the vast and ever-increasing population of a comparatively narrow belt that is devoid of any forest growth is a matter of great importance. In such areas, the general standard of living is reduced, and the greatest calamity of all — the burning of animal manure as fuel — commences. This practice deprives the villager's fields of an essential source of fertility. The crops have less and less nutritive value and ultimately a vicious circle of general poverty is created.

The main problem is how best to supply the need

for small timber, fuel, fodder, and other forest products in the areas which are devoid of any forests or of scientifically managed forests. Though good quality timbers do not grow in all provinces, their intrinsic value permits costly haulage, including long distance transport by railway or by sea. Consequently, an area that is short of such timber can always get its requirements from other areas. But fuelwood, fodder, grass, and fencing materials — all items of forest produce that are intrinsically valuable in the agricultural economy of a well-defined tract — cannot stand very costly haulage. It is, therefore, highly important that the supply of such locally important forest produce should be increased within local limits and be made available within easy reach of the consuming public.

The question, therefore, arises as to how a suitable scheme of reforestation of such densely populated areas can best be achieved. Any plan which aims at self-sufficiency in respect of fuelwood and other forest produce for the ordinary village consumer must involve a great deal of rehabilitation of waste lands and artificial plantation of fuelwood and fodder reserves on an ambitious scale. Owing to tremendous pressure on lands for agricultural purposes in this zone, lands for other purposes have become scarce. Nor is it feasible to cry a halt to the *Grow More Food* programs. The main concentration, therefore, must be on whatever village wastes and degraded forest areas are available. These local fuel and fodder forests need not encroach more than lightly upon potential food production, for they do not require land that is suitable for crops. But as population growth necessarily imposes the need to improve land use, degraded village wastes and unproductive forest areas should now be turned to good account and made productive once again. Apart from such lands, the lands along public roads, canals, and railroads offer the most promising locations for planting schemes. These tracts may not be suitable for grazing purposes, but if well-selected fodder species are also planted, they may go a long way towards relieving fodder scarcity in such areas.

To many minds, such an undertaking would appear to be a long-term undertaking, and this would, of course, be true in the case of plantations for timber production. But it does not seem to be equally true of suitable fuelwood species growing under a short rotation. In regard to such cropping, this idea of long-term returns is apt to be overemphasized.

In recent years the question of farm forestry has received considerable attention. Although much has been achieved by farm forestry and much more can be achieved by the introduction of a more rational land use, this development is entirely dependent on the existence of farms of suitable size. Because of the fragmentation of holdings in many countries in this region, farm forestry alone, as understood in advanced countries, can hardly solve the problem. But the formation of co-operatives that would provide the technical control of a number of fragmented farms at low overhead cost may go a long way towards solving this baffling problem. With the technical advice of the Department of Forestry, local authorities now established in many parts of the country could take over the administration of such village co-operatives.

As a short-term measure towards the solution of fuelwood problems in scarcity areas, it will be necessary to prevent any avoidable waste by conserving all sources of power and energy. Sawdust and coal briquettes with a suitable matrix can possibly be of help in solving this problem. The destructive distillation of wood on an extensive scale reduces bulky transport and may not involve an expenditure that would be prohibitive for the common consumer. With proper research into the utilization of these methods, a solution of this intricate question can be found.

Conclusions

The three zones of availability of forest produce outlined here may be peculiar to the Indian Union, and possibly in many other regions the distinctive belts or tracts are less clear-cut. It is, therefore, necessary to consider the question of over-all forest resources in all territorial units, with a view to examining the question of easy supply of fuelwood, fodder, and other forest products to the rural population. In the Near East, countries are short of the necessary forest areas. In Southeast Asia, though, the situation is generally better than in the Near East. Shortages have also assumed serious proportions in China and a few other countries.

It has been assumed rather arbitrarily that at least 20 to 25 percent of a country's total land area should be under forest, and that this area, if properly maintained, should be sufficient to meet the demands of the people. But mere acreage figures based on a percentage of total area do not reliably indicate whether the forests are ample to meet all domestic needs. In the first place, it must first be ascertained whether the forest areas are all productive on a sustained basis. Equally important is the question of the distribution of such forest area. If the forests are crowded into one part of the country, the question of easy supplies of necessary forest products to the cultivator will always remain more or less insoluble. An even distribution of forest areas throughout the centers of demand is very important. This is the crux of the entire problem. With effective distribution of forest areas, it might be possible to do with less area than the limits indicated above. A third important consideration in this connection is the density of population. Where the population is more crowded, the demand for supplies of forest products will be greater.

Apart from the domestic demands of the population, the requirements of forest products for industrial development are of outstanding importance. At present the distribution of industrially useful species is limited, but as research proves the commercial utility of more species of trees, shrubs, and grass, their large-scale production will have to be undertaken. The forests on the slopes should mostly be classed as protection forests and will presumably not contribute substantially to commercial production.

To relieve the pressure on forests due to increases in population and in livestock numbers and to meet the growing industrial demand for forest products, therefore, all forest areas now under private control should be taken over by the State and their productivity increased. The Conference should, therefore, consider the question of recommending to governments the abolition of private ownership of forest

land, where feasible, and should also urge a well-defined policy for effective control over such forests on the principle of sustained yield.

All countries should also examine the extent and distribution of their forests with due regard for the agricultural population. In formulating plans for reforesting denuded areas and creating new forests, a prime consideration should be easy accessibility of rural consumers. Since intensive research in silviculture is necessary for raising plantations of fast-growing species efficiently on poor and degraded lands, the results of such research now being undertaken in different countries should be assembled and circulated to member countries for planning purposes. In this connection the creation of an organization to advise member governments on special problems bearing on this subject should receive most careful attention.

Meeting Asia's Timber Needs

By S. KAMESAM, Timber Constructional Engineer, Bangalore, Associate Delegate for India

IT IS questionable whether the present shortage of timber supplies in the more developed countries of Asia, for example India, is actual or relative. The situation may have arisen and may persist through lack of an efficient policy of integrated and scientific structural and industrial utilization of timber planned to obviate waste in conversion and utilization.* In the past such a policy has been conspicuously absent and owing to wrong engineering design and the use of untreated timber, we have been wasting timber on a colossal scale. If the problem of utilization is tackled properly, and if the timber "surplus" countries of Southeast Asia co-operate with the "deficit" countries, there need be no apprehension over a timber famine or over inadequate supplies in the coming years for even large-scale industrial development.

This article deals with three important problems that face Asia today: (1) fuel for urban areas, (2) timber for rural housing and other rural needs, and (3) structural timber for urgent industrial development schemes and for the maintenance of existing public utilities.

Urban Fuel Needs

Owing to the urgent demand for posts and fuel by the military during the last war, fuel resources near towns and cities have reached almost the exhaustion point and today urban fuel requirements often have to be transported over a hundred miles. These long hauls for the transport of fuelwood have thrown an additional burden on the railways which, owing to neglected maintenance, are hardly fit to take even the strain of normal traffic. There are cities in the region which, in spite of special and very useful organizations for maintaining fuel reserves, have on some occasions been faced with real fuel starvation. A solution would be the exclusive use of charcoal instead of fuelwood in urban areas. But in India, for example, the annual production of 9 million tons of charcoal is produced by the most primitive methods. It is most necessary, not only for reducing the weight of fuelwood to be carried by railways to towns and cities, but also for the conservation of natural resources, that a well-integrated scheme of modern wood carbonization, recovering all the by-products, should be considered. The Swiss Strupp process, the "circulating gas method," deserves special mention here. It is essential also, of course, to develop efficient charcoal-burning stoves and ovens for use in urban areas and to provide for their mass production. These should be sold on a non-profit basis by governments direct to the people.

In places where cheap hydroelectric power is available, full advantage should also be taken of this source of energy for heating and cooking. In most countries of the region the heating required is small as the cold season is rarely of long duration.

The growing of municipal or community forests within as short a distance as possible from built-up areas is recommended. Quick-growing fuel species, which can be harvested once every five years, should be planted at the beginning of the monsoon. The possibility of using tree-planting machines — even helicopters for carrying seedlings to areas not connected by roads, or airplanes for broadcast sowing of seeds — should be investigated.

Timber for Rural Housing and Other Rural Needs

Ninety percent of the population of India and Pakistan, and of some other Asiatic countries, lives in villages, where the housing conditions are appalling and a disgrace to modern civilization. The flooring of the house is most insanitary, consisting of mud "stabilized" by repeated coatings of cow dung, which acts as a nutrient medium for the growth of bacteria and insects responsible for many tropical diseases. The walls consist mostly of mud or mud plastered over untreated bamboo or poor timber. There are probably a few sapwood posts imbedded in the mud walls, and also smaller posts serving as door frames and frames of windows, if windows are provided at all. The ground being infested with white ants, the

*Note: Considerable work has been carried out by the United Nations Economic Commission for Europe, through its Housing Subcommittee and Timber Committee, on economies to be achieved in timber consumption. A report on *Possible Timber Economies in Construction* has been prepared. FAO, through the chairman of its Mechanical Wood Technology Committee, is completing a study on more rational wood utilization. The United Nations, also, is devoting increasing attention to the whole field of housing and town and country planning.—Editor.

timber or bamboo members last hardly two or three years when the whole structure has to be rebuilt. The roof consists again of sapwood poles or posts, split or unsplit bamboos, bamboo matting or palm leaves. Such roofing is tinder-dry before the onset of the monsoon and highly inflammable, and in other seasons of the year gives refuge to snakes, scorpions, and poisonous spiders, which take a heavy toll of lives every year in the tropics. Gradually destroyed by termites and rot, these roofs often collapse suddenly during storms.

The villager therefore lives in a very unhygienic and uncomfortable home, with the most elementary protection against sun, rain and wind. How can man rise to normal stature in such surroundings?

With the present timber shortage that is spoken of, is there any possibility for improving these homes? Many people seem to reply "No." India is trying to import from America aluminum for house frameworks and roof trusses. But the country is faced with a $2,500 million shortage this year and the need to buy 2 million tons of food from abroad. It is also endeavoring to import steel at exorbitant prices. These metals are not needed. An interim solution to the problem of rural housing in Asia could be based, to a large extent, on the integrated and scientific utilization of the bamboo resources of the region.*

This could be the best approach for solving the housing problem of 95 percent of the population. There are more than adequate bamboo resources remaining unexploited in the region for all the housing required. Bamboo becomes mature within a period of four to five years, so that this structural material, nature's cheapest box-girder, can be harvested on a five-year rotation. The exploitation of bamboo does not call for any expensive or intricate machinery, and its transportation is easy with the millions of bullock carts and floating streams available in the region. All that is needed is standardization, prefabrication, and mass production of building elements after architects and engineers have developed aesthetic designs of different types of rural houses. The knowledge of how to make these houses already exists. The roofs present certain difficulties but these are certainly not insuperable and there are several designs suitable for immediate adoption, even in areas of high wind pressure or high rainfall. Engineers may well consider the possibilities for economy and efficiency in using laminated wood or bamboo "boomerang arches," so that the hinges are at ground level and the walls and roofing form a continuous surface.

There are other timber requirements in villages which deserve a passing mention, and here also the possibilities of standardization, prefabrication, and even mass production should be borne in mind. The question of supplying a more scientifically designed, strong and durable bullock cart to villagers is most important. Again, every villager has one or two plows that could be better designed and mass produced for improved performance, greater durability, and lower cost. Properly preserved fence posts and fencing could replace the millions of cubic feet of fencing which are eaten up annually by termites or borers. Nobody ever seems to think of furniture for villagers, but if standards of living are to be improved, the villager should not only be provided with good dwellings but also with his elementary needs in rural furniture. The state should put up factories for the mass production of such furniture.

*A positive approach to the problem of housing in the tropics appears in "Huts and Houses in the Tropics," *Unasylva*, Vol. III, No. 3, p. 100.

Industrial Utilization of Wood

The question of providing timber for industrial purposes is a most extensive subject. The Government of India is preparing a comprehensive scheme for the use of treated wood and bamboo in place of steel, which today is the "kingpin" of industrial development. Five or six important aspects of industrial construction will be dealt with in the present article.

Railway Sleepers

At present, in many countries of this region, not only the bulk of the timber but also its "cream" is commandeered for sleepers by the governments who almost invariably own the railways. It seems absurd that a first priority should in this way be given to railway sleepers which are most primitive in design. Until recently not only have the best grades of timber been appropriated but also the most durable species, like teak. The cross section of the sleepers was fixed nearly a hundred years ago when easily accessible virgin forests were still standing. A cross section of, for example, 10 inches x 5 inches (25 x 13 cm.) for India, requiring about 340,000 m^3 (s) (12 million cubic feet) of straight-grained and well seasoned timber annually, seems to involve a colossal waste, as for this cross section not only very large-sized trees and tree portions must be used but there is a wastage of nearly 50 percent of the log in conversion. The so-called "flats" left after sleeper conversion are either burnt in the jungle or left to decay. The same width and number of sleepers per mile are used in Asia as in temperate countries although some of the Asian hardwoods have 50 to 75 percent more strength than the hardwood or softwood sleepers used in other countries. The possibility of saving at least 30 to 40 percent of timber in railway sleepers, and the reduction of waste during the conversion of logs from 50 to 10 percent should be fully explored, as well as the fabrication of sleepers using poorer grades and smaller sized timbers. No sapwood of any timber should be rejected, as with impregnation it can be as durable as the heartwood.

Electrical, Telegraph and Telephone Supports

Cheap hydroelectric power will be the means for extensive industrial development in Asia and a number of electrification schemes are now being considered or undertaken by most of the governments in the region. These require large numbers of electrical transmission, distribution, and telegraph and telephone poles, varying generally in length from 20 - 36 feet (6 - 11 meters) with butt diameters from 6 - 12 inches (15 - 30 cm.). These posts would have to be pressure preserved. Besides these posts, hundreds of thousands of cross arms for supporting the wires are also required. These can, in many cases, be cut from the "flats" left after sleeper conversion and can be specified with sleeper indents.

There are one or two aspects of pole design which have been curiously lost sight of in most countries and

which could save initially about 30 percent of the timber, besides about an equal proportion of wood preservative. The possibility of the use of "half moon" section poles deserves close examination. The present practice of using a section with equal strength in all directions is obviously a waste of material. The use of a tapering or built-up pole, especially for longer lengths and the designing of poles according to regional specifications instead of for a country as a whole may perhaps save up to 50 or 60 percent of the timber now used. The same dimensions of poles as are used in America have been used in Asia for tens of thousands of poles although the strength of the Asian timber is two and one-half times as much as that in America.

Extraction of poles from mountain regions in lengths greater than 12 or 15 feet (3.7 or 4.6 meters) is often difficult. Their utilization therefore depends on the design of a suitable pole joint which has already been worked out. The impregnation of a butt section, approximately equal to a quarter of the length of the pole, would preserve that section for 30 to 40 years. The remaining portion of the pole exposed to much less severe service conditions, could be impregnated not only with a lighter treatment but with a wood preservative more efficient in resistance to volatilization than to leaching. Gallons of wood preservative could be saved by adopting this suggestion. The use of solid bamboos for electrical, telegraph, and telephone supports is now possible.

Industrial Buildings

The use of "rigid types" of arches, pole trusses, with or without bamboo composite construction, should be introduced on a large scale. If such timber or bamboos are pressure preserved, they can give an almost indefinite period of life with no maintenance costs. They can easily be made highly fire resistant by either suitable impregnation or the application of a fireproofing paint. There is no justification for the use of steel, which requires to be protected annually by paint, for large-span roof trusses up to 200 feet (60 meters), purlins, etc. In some cases there is also no need for cement or steel or even bricks for walls if the suggestion for "boomerang arches" made earlier in this article be seriously considered.

Marine Construction

More than 95 per cent of the marine front of the United States of America consists of pressure-treated wood piles, fenders, decking, etc. All-wood ships are being built in several countries, up to an ocean tonnage of 3,000. By proper utilization, countries in Asia should be able to develop their timber resources for meeting marine requirements in this direction.

Urban Housing

The remarks made in the section dealing with rural housing apply here with equal force. The need for standardization and prefabrication of doors and window frames and shutters, built-in furniture, and housing components, designed on a modular basis, is important. The present trend of design, based completely on structural postulates, is hardly correct. Sociological factors and not merely factors of strength and tradition should determine the design of urban housing as well as the choice of building materials. The present general trend of housing design in India has remained practically the same for a century. Housing design in India should follow the lines of that in Japan, where the whole house is built of light material, wood and bamboo, with some light plaster, and not designed as a "fort" with iron bars for all windows. Houses in Asia should be durable, to last 25 - 30 years, but should be light and elastic, consisting of building elements whose size and position can be easily and inexpensively changed.

While during the last century the father built a massive house where his children, grandchildren, and great grandchildren all might live, it has become almost general that the son seldom lives in the house built by his father and that the father himself would like to change the design of the house periodically, according to the needs of the family and the number of members living in the house. The need for "extensible" and "reducible" houses is becoming more urgent. With a rising standard of living and a rising cost of labor for maintaining a house, this factor will gradually become increasingly important in the East.

The cross sections of door and window frames and the thickness of door and window shutters used in India have remained the same for nearly a hundred years, with hardly any basis in engineering design. The thickness of materials used for door and window shutters, for instance, could be reduced by about 50 percent. The present cross sections of beams, rafters, purlins, used in open house construction are highly wasteful. They are a legacy of the carpenters' age when the carpenter performed the functions of an engineer. A third of the timber used at present could be saved by proper design with very little machine fabrication. The use of laminated beams could make a further saving of 15 percent. Wood is the proper material for building houses in Asia. Its high strength in relation to weight, the ease with which it can be cut and altered on the spot with simple hand tools, its relatively high thermal insulation capacity, its high durability when treated, lead to low maintenance costs. Its relatively low initial costs and its high aesthetic appeal are all factors in favor of its selection.

Highway Bridges

Designs now existing make it possible to erect in Asia highway bridges of any span up to 70 feet (21 meters), using local material and local labor and carpentry tools which local artisans, even in villages, have long been adept at using. Any extensive program of rural development is necessarily linked with the extension of rural highways which automatically means construction of numerous bridges.

Relative Economy of Treated Wood, Steel, and Concrete

The present tendency of engineers to pin their faith on the so-called permanent materials like reinforced concrete and steel is a fallacy. At the rate that technical innovations and revolutionary scientific developments have been taking place during the last two decades, there is little doubt that most structures, including houses, will become obsolete in another 30 years. Some may have to be scrapped within an even shorter period. Assuming then that the obsolescent

period of most structures is 30 years, the use of treated wood and bamboo is more economical than use of steel or reinforced concrete in the case of practically every structure.

In this article the chemical utilization of timber has not been touched on. Nor has the necessity of reorientating forest policies in line with improved utilization. but the writer believes that there need be no serious apprehension of a timber shortage in practically any Asiatic country. By timber engineering one cubic meter (r) can do the work of two cubic meters (r). By pressure wood preservation, one cubic meter can do the work of ten or twenty cubic meters. By substituting split or solid bamboo for wood, thousands of cubic meters of timber can be saved. More thousands of cubic meters can be saved by standardization, prefabrication, and by mass production methods. Those who aim at the maximum of public economy should make sure that no false economy or enslavement to tradition is permitted to thwart their judgment in the selection of structural materials.

Expansion of Production and Distribution

By J. P. EDWARDS, Deputy Director of Forestry, Federation of Malaya

MALAYA welcomes the opportunity of representation at this Conference because we feel that in the fields of management, silviculture, research and utilization, we have reached a stage of development which makes it possible for us to offer something to our neighbors in a spirit of international co-operation.

In spite of developments in the tin and rubber industries, Malaya is still largely a land of jungle, no less than 77 per cent of the total land area being under forest. Thanks to a sympathetic and consistently forest-minded government, coupled with sound forest administration in the past, a satisfactory proportion of 21 percent of the total land area has already been constituted Forest Reserve, and reservation is still incomplete in the Eastern States. Malaya owes a lot to those early foresters who so well and truly laid the foundations of the country's forest economy. It will not be out of place here to mention the names of A. M. Burn-Murdoch and G. E. S. Cubitt who came to Malaya from India, bringing with them the great knowledge and experience they had gained in this, the nursery and first home of scientific forestry in Asia.

For a country of only 51,000 square miles (132,000 km^2), less than twice the area of this State of Mysore, the production of timber, fuelwood, charcoal and other forest products is considerable. I will not weary the Conference with strings of figures here but would draw attention to the Note which has been circulated in which some of the more important Malayan forest statistics are set down.* The point I wish to make, however, is that potential timber production, working strictly within the limits of the sustained yield principle, is considerably greater than anything actually achieved, and that the present modest export of sawn timber [1,800,000 cubic feet (over 51,000 m^3 (s) or 36,000 tons in 1946] is capable of very considerable expansion. Many countries want timber and other forest products, but only a few have a surplus for disposal; the problem is to get those surpluses to the places they are most needed. This problem must be the concern of all of us, and its importance is emphasized by the main heading of this item of the Agenda, "Expansion of production and distribution of lumber and building materials." Governments, and international agreements between Governments, can help in this matter in various ways, such as the wise control of exports, the acceptance of standard nomenclature in respect of timbers and timber trade terms and the introduction and publication of agreed Grading Rules suitable to all markets. But the actual business of buying and selling timber should, in my opinion, be left to free commercial enterprise as untrammelled by irksome restrictions as possible. The timber trade in all countries is an old-established one and the men engaged in it are experts; help them and you help the flow and expansion of international trade — hinder them by restrictive regulations and you clog the wheels of industry with the sand of outmoded bureaucracy. Governments then — and conferences — must be very careful not to interfere with normal trade channels.

If that is agreed, how can this Conference help the timber trade? We can recommend to our governments, and through them to our forest departments, certain lines of action. Let us now consider these in more detail. First there is expansion of production. In Malaya this problem is being tackled by a comprehensive program of forest road construction which will, within the next few years, render accessible hitherto untouched areas of rich forest and which will have a marked effect on the availability of sawlog supplies to the mills.

Uniform Nomenclature

Next there is the question of a uniform nomenclature for commercial timbers which is particularly desirable to facilitate the trade between Asian countries. What we require is a standard of reference which will enable the importer in Bombay, for instance, to know exactly what he is likely to get if he orders say *keruing* from Malaya, *apitong* from the Philippines, or *yang* from Siam. A considerable amount of work has, however, already been done in this field and the attention of the Conference is drawn to the publication *Nomenclature of Commercial Timbers* issued by the British Standards Institution which gives the standard name, botanical identity, and sources of supply of timbers, both hardwood and softwood, commonly imported into the United Kingdom. It is not a complete work insofar as it does not list the many timbers imported and exported within the Asian and

*See "News of the World," page 160.

Pacific area which seldom, if ever, find their way to the United Kingdom. The pattern of the BSI publication might well be followed in the compilation of a similar work covering the area with which this Conference is primarily concerned.

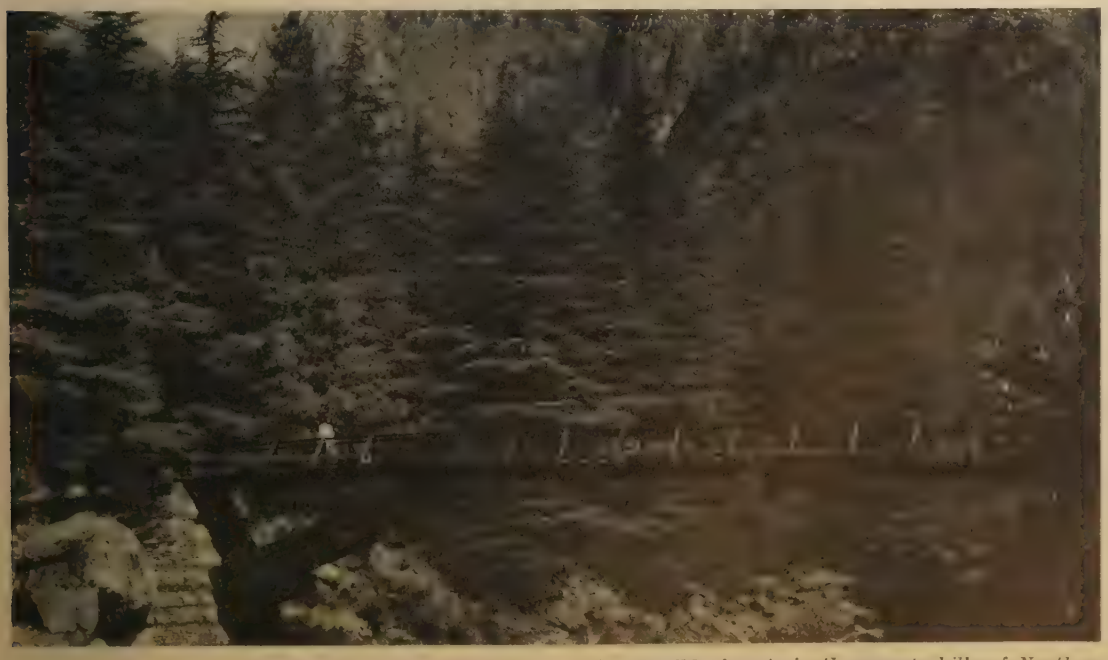
A beginning has already been made in several countries and I think I am right in saying that authoritative articles on the subject of standard nomenclature have appeared in the *Indian Forester, Tectona,* and *The Malayan Forester,* in addition to purely official publications issued by the governments of a number of countries which certainly include India, Australia, Burma, Indonesia, Malaya, and North Borneo. It ought not to be a very difficult matter for a co-ordinating committee to collect, collate, bring up to date, edit and publish the considerable mass of information already available.

Another important need is some official standardization of timber trade terms, a subject intimately connected with that of grading rules, and perhaps best tackled from that angle. Point is given to the need for standardization by the use, at this Conference, of two terms both describing the sawn outturn of a log — the American "lumber" and the British "timber." The American term is perhaps the more rational and probably stands more chance of universal acceptance, but whether the very conservative United Kingdom timber trade will ever do so is disinctly open to doubt.

Grading Rules

Now we come to the question of grading and the necessity for a set of simple rules which will assist both exporters and importers in their transactions—for it should be recognized that dealings in timber, as in any other commodity, must primarily be a matter of arrangement between buyer and seller. It must be remembered that logs however carefully sawn yield little, if any, timber *entirely* free from defects. It is therefore essential to admit defects but to limit them by rules applicable to the various grades and types of stock. Such rules should provide standards of measurement and quality which will be readily understood by all concerned and, at the same time, ensure provision of timber suited to the general or specific use required by the buyer. Grading rules to be effective should be applied by an impartial authority; that is to say that the timber should be graded by competent graders unconnected with either buyer or seller. In the United States of America and Canada the National Hardwood Lumber Association is generally recognized as the impartial grading authority and the Association's Grading Certificate is issued to cover all timber graded by their inspectors.

In Malaya timber for exacting or "high-class" markets such as the United Kingdom, Australia, and South Africa is graded under the "Empire Grading Rules" by government timber inspectors, and a fee, at present fixed at five cents per cubic foot, is charged for the service. An official Grading Certificate is issued which has come to be regarded as the buyer's guarantee that the timber is up to the standard ordered and paid for. Asian markets are usually much less exacting and in most cases are content with "run of the mill" material or little better. Such timber is really not graded at all or is "mill graded" to no fixed rules, which means, in practice, that the worst pieces are eliminated. A grading authority should, however, be prepared to grade to any rules definitely agreed between buyer and seller, provided the rules are sufficiently clear to prevent any misinterpretation. In practice this is extremely difficult and buyers usually prefer to have their timber graded to recognized



Bridges of locally available timber are needed to open up inaccessible forests in the remote hills of Northern India.

standards such as NHLA rules or the Empire Grading Rules, but admitting certain tolerances in excess of those laid down, as for instance in respect of size, sapwood, or worm holes.

Mention has been made of the fact that in Malaya we are still using the Empire Grading Rules. These rules were first drawn up in 1932 by a specially constituted subcommittee of the Imperial Institute Advisory Committee on Timbers, on which served representatives of many countries including India, Australia, New Zealand, Burma, and Malaya. I do not think that the rules were, in fact, ever widely used, and so far as Malaya is concerned it has been evident for some time past that they have not been entirely satisfactory in practice. Their application to many of the "new" Malayan timbers now being exported has revealed an undesirable rigidity, while the whole format of the rules proved unsuitable in the case of purchases by the United Kingdom Timber Control Department of the Board of Trade.

In view of these considerations a new set of rules to be known as the Malayan Export Grading Rules has been evolved and is now in draft form. These proposed rules follow more closely the set-up of some American rules while retaining some of the best features of the Empire Grading Rules.

They have, in fact, a broad basis and will, it is hoped, prove applicable to timber destined for some Asian and Far Eastern markets. Some modifications, including perhaps provision of a grade below "Standard" will certainly be required; but I suggest to this Conference that here is a set of rules, already in draft, that might well form the basis of a uniform grading system throughout Asian territories. Copies are available if interested persons will write to the Director of Forestry, Federation of Malaya, Kuala Lumpur.

Photos on pages 134, 136-9, and 150 by courtesy of Press Information Bureau, Government of India.

Cover photo and photos on pages 143 and 149 by courtesy of Forest Research Institute and Colleges, Dehra Dun, India.

Other Papers

The following are the titles of further papers presented to the Conference:

Forestry Advances in Asia and the Pacific, Opening address by the Director of FAO's Division of Forestry and Forest Products

Expansion of Production and Distribution—Problems of the Philippines, by F. Tamesis, Director, Bureau of Forestry, Manila

Expansion of Production and Distribution in Indonesia (Netherlands delegate)

Potential Timber Supplies from New Zealand, by A. P. Thomson, State Forest Service, Rotorua, New Zealand

The Malayan Export Grading Rules for Rough Sawn Timber (United Kingdom delegate)

Suggestions for the Classification of Commercial Timber (Delegation of France)

Logging, Milling, and Road Construction Machinery (Delegation of France)

Recognition by Governments of the Importance of Forest Resources (Delegate of Burma)

Need for Trained Foresters, by C. A. R. Bhadran, Director of Forest Education, Forest Research Institute and Colleges, Dehra Dun

Minor Forest Products, their Development and Exploitation, by R. L. Badhwar, Chief Research Officer, Chemistry and Minor Forest Products Branch, Forest Research Institute, Dehra Dun

Policy, Legislation and Administration, by E. de la Cruz, Professor, Forest Policy and History, University of the Philippines

Land Use Policy, by J. Banerjee, Project Officer, Central Waterways, Irrigation and Navigation Commission, Government of India, New Delhi

Conservation and Protection in Ceylon, by K. Kanagasundram, Deputy Lands Commissioner, Ceylon, Colombo

Roving Agriculture in Indochina, by A. P. Chollet, Chief Inspector of Waters and Forests, Saigon, Viet Nam

Reforestation and Afforestation (New Zealand delegate)

Soil Erosion (Netherlands delegate)

Exchange of Professional Information (Pakistan delegate)

Modern Inventory Methods, by K. R. Nair, Statistician, Forest Research Institute, Dehra Dun

Technical Developments in Air Survey and the Interpretation of Forestry Data Therefrom (New Zealand delegate)

Integration and Modernization of Forest Industries (Delegate of Burma)

Modernization of Forest Industries, by S. Kamesam, Timber Constructional Engineer, Bangalore

Capital Requirements (Pakistan delegate)

Trade Policies and Promotion (Philippine delegate)

Trade Policies and Promotion (Netherlands delegate)

Some Statistics on Korea (Korean representative)

Situation in Siam (Delegate of Siam)

Climate in Relation to Forests (International Meteorological Organization representative)

Labor standards—Working and Living Conditions (New Zealand delegate)

C. R. Ranganathan, President of the Forest Research Institute and Colleges at Dehra Dun, associate delegate from India, made important contributions in the deliberations of the Conference. At the right is S. Kamesam, also an associate delegate for India.

Commodity Reports

Softwood Lumber

At the close of World War II there appeared to be a very wide gap between available supplies of softwood lumber* and immediate needs. It was expected that as needs came to be assessed on a more realistic basis,† supply would be seen to be in approximate balance with effective demand. The latter part of 1948 marked the beginning of this transition period, as was indicated in the softwood lumber report given in UNASYLVA, Vol. III, No. 1. Events of early 1949 have confirmed the trend. This holds true also for most other commodities.

On a world basis, supplies in 1948 of softwood lumber available for international trade actually appear to have been in excess of effective demand, owing to the inability or unwillingness of many countries to

*The term lumber, as used by FAO, covers the following categories of sawn wood: planks, boards, deals, battens and large timbers both rough and planed; squares; flooring; laths; singles; and boxboards. Railway sleepers (crossties) are excluded. Wherever possible, adjustments are made to national statistics which do not conform to this definition; if adjustments are not possible, the difference in coverage is noted where known. Differences in coverage may account for many of the discrepancies between figures quoted by FAO and figures shown in other sources.

†Needs as measured by governmental and business expectations, not real requirements for social progress.

PRODUCTION AND TRADE IN SOFTWOOD LUMBER

Country	Production		Imports		Exports	
	1948	1947	1948	1947	1948	1947
	(Thousand standards)					
North America						
Canada	[1]2,590	[1]2,700	10	30	1,248	1,378
United States	[2]14,200	[2]14,150	836	556	240	591
Europe						
Importing Countries						
Belgium	26	[3]30	85	100	...	1
Denmark	62	51	144	106	[4]38	*
France	642	697	150	147	58	42
Germany:						
Bizone	1,032	832	...	—	159	249
Fr. Zone	249	260	...	...		
Greece	11	26	38	13	—	—
Hungary	[5]7	[6]5	[6]70	56	...	—
Ireland	6	10	31	25	...	—
Italy	153	214	[7]64	61	...	...
Luxembourg	3	3	...	1	...	*
Netherlands	3	2	320	237	...	—
Switzerland	268	247	17	22	...	10
United Kingdom	[8]75	239	884	1,195	...	[7]2
Exporting Countries						
Austria	269	231	...	*	104	[9]35
Czechoslovakia	...	583	...	—	70	125
Finland	810	740	...	0.2	489	445
Norway	[10]280	275	15	30	10	[7]7
Poland	561	376	...	5	37	—
Sweden	[2]967	1,200	18	27	545	416
Yugoslavia	...	...	...	...	101	52
Near East						
Turkey	26	25	...	*	...	7

. . . Not available. -None. *Less than 500 standards.

1 standard = 4.672 m³(s) or 1980 board feet

[1]Includes hardwood lumber production which in 1947 was about 337,000 standards.

[2]Estimated

[3]Includes 9,000 standards produced in Germany.

[4]January June only

[5]January March only

[6]January August only

[7]May include hardwood lumber

[8]Incomplete. Production from domestic sawlogs only. In 1947 the corresponding figure was 67,000 standards.

[9]Includes prefabricated houses

[10]January September only. May include some hardwoods.

make large lumber purchases in hard currency areas. In addition, demand was affected by the reluctance to buy which always marks periods when it is anticipated that prices may take a downward trend.

A weakening of prices for lower grades was evident at the end of 1948 and definitely marked during the beginning of 1949. The better grades of lumber have, however, continued to be in good demand and by all reports prices have not been appreciably lowered.

The table on page 151 shows the 1948 information available on production and trade in softwood lumber in North America and in Europe, firm data for other areas not being available. Softwood lumber production in North America as a whole declined somewhat in 1948 from 1947 levels; but at the same time production in many European countries such as Austria, Finland, Germany (Bizone), and Poland was increasing. Production in Italy decreased considerably.

Imports into the United Kingdom in 1948 appear to have been much lower than in 1947, while imports into the United States of America and into prominent European importing countries such as Denmark and the Netherlands show a marked rise.

Total lumber exports from North America dropped considerably in 1948. U.S.A. exports were 50 percent below the 1947 level. (Plywood exports dropped 74 percent.) Exports from Austria, Finland, Sweden, and Yugoslavia showed definite gains.

Some notes on the softwood lumber situation in individual countries follow.

Canada

Production: The latest official reports of total softwood and hardwood lumber production estimates give figures of 2.59 million standards in 1948 and 2.7 million standards in 1947. Production in 1948 increased by 11 percent over 1947 in Alberta and by 2 percent in British Columbia; production in all the other provinces declined. Production estimates for January and February 1949 for all provinces except British Columbia indicate a decline in production for these two months of 3 percent under the corresponding period of 1948. It is assumed that this decline is occasioned principally by cuts in European sales.

Trade: Total softwood lumber exports in 1948 declined 130,000 standards from 1947 levels. Exports to the United States, however, were 824,000 standards, contrasted with 543,000 standards in 1947. Exports to the United Kingdom, which totaled 542,000 standards in 1947, fell to 277,000 standards in 1948, and exports to other important destinations also dropped. The problem of rapidly shrinking international markets for Canada's forest products merits special action.

The total 1948 softwood lumber exports included 429,000 standards Douglas fir, 408,000 standards spruce, 136,000 standards hemlock and 95,000 standards pine. The volume of red cedar shingles alone totaled 80,000 standards.

United States of America

Production: Latest reports from the United States Department of Commerce, which take into account revisions necessitated by the publication of census data, estimate production of both softwood and hardwood lumber to have been 17.2 million standards in 1946, 17.9 million standards in 1947, and 18.2 million standards in 1948. For softwood lumber, census data indicate that 1946 production was 13.07 million standards in 1946, and 14.15 million standards in 1947. Industry estimates place 1948 production at 14.20 million standards. Almost all the 1947 increase took place in the western states.

Domestic requirements in 1949 for softwood and hardwood lumber for construction purposes are expected to be 3½ percent lower than in 1948, 11.78 million standards against 12.17 million standards. A decline in production during 1949 may therefore be expected. This expectation appears to be supported by data collected by the National Lumber Manufacturers Association (NLMA) for the first eighteen weeks of 1949, which show that production by southern pine mills declined 9 percent from the figure for the same period of the previous year. West coast mills declined 13 percent, and western pine mills declined 19 percent. Since the mills reporting to the NLMA tend to represent the larger and more stable producers, total production may be still lower than these percentages indicate since many non-reporting marginal mills have been forced to close.

Stocks: NLMA data for stocks in the hands of Southern pine, west coast, and western pine mills as of 7 May 1949 indicate that stocks are more than 40 percent higher than a year previous for the same mills. Unfilled orders in the hands of these mills were about 19 percent lower than a year earlier.

Prices:

U.S. Wholesale Price Indices
(1939 = 100)

Item	1948			1949	
	Jan.	June	Dec.	Jan.	Feb.
All Douglas fir lumber	359	391	371	360	361
All Southern pine lumber	361	341	330	320	313
All Western pine lumber	305	333	341	341	341
All lumber	330	336	328	321	318
All other building materials	214	218	223	223	223

Source: U.S. Department of Commerce, Office of Domestic Commerce, *Lumber Industry Report*, Washington, D. C.

Latest reports for the month of March indicate that most prices have remained steady; a few have gone up and a few have declined still further.

Regional reports to the Department of Commerce for February and March 1949 indicate that prices for higher grades are firmer than prices for lower grades.

Trade: Quota controls over lumber exports have been removed from all items although licenses may still be required in certain instances. Efforts are being made to secure additional export trade both on government and private levels, as the decline in business is causing serious concern.

Softwood lumber exports in 1948 totaled 240,000 standards of which 70 percent were Douglas fir, 23 percent Southern pine, about 3 percent Ponderosa pine, and the remaining 4 percent other softwoods. In 1947 softwood exports totaled 592,000 standards.

EUROPEAN EXPORTING COUNTRIES

Austria

The lumber industry is said to be working at about one-third of its normal capacity and no change is expected in the immediate future. Attempts are being made to regain the normal German export market which is of particular importance to the bordering

districts, but this has not been possible on a large scale.

Private building activity remains somewhat curtailed. Domestic prices are controlled.

Finland

At the opening sales for sawlogs for the 1948/49 season, prices showed a downward trend. During 1934-38 it is said that stumpage prices averaged about 71 percent of the cost of sawlogs at the mill, whereas now it is estimated that stumpage prices represent about 36 percent of the total cost of sawlogs, which is due to the rise in transportation and other costs.

Trade: Exports to the United Kingdom, the U.S.S.R., Denmark, the Netherlands and Belgium accounted for more than 75 percent of total 1948 lumber exports, the countries being listed in order of their importance.

A trade agreement has been concluded with the United Kingdom for delivery in 1949 of 190,000 standards of lumber.

Prices: An agreement with the United Kingdom was concluded in the latter part of April 1949 after lengthy negotiations. The new prices are on the average 4-5 percent lower than those prevailing during 1948. Prices of the lower grades went down by 7-15 percent. The prices of most of the better grades went down slightly or not at all, although some of the most valuable grades advanced somewhat.

In Finland the result of these price changes will affect adversely high cost mills unfavorably situated. If the exchange rate remains unchanged, the only way to avoid losses is reported to be reduction in costs.

Norway

It is believed possible for domestic production to meet the needs of the building program and still leave small quantities available for export. Domestic prices are under strict control and are about half the export prices.

Poland

Production increased over 50 percent in 1948 as compared with 1947. Production was highest in the newly acquired territories which contain about half of all the woodworking industries.

Trade: The year 1948 marked the entrance of Poland into the lumber export market during the postwar period. It is reported that plans for 1949 call for an increase in lumber exports to 50,000 standards, as compared with the 37,000 standards exported in 1948. The government has announced the policy to export wood in the most highly manufactured form possible.

Sweden

At the important forest auctions in October 1948 it is reported that the prices obtained for sawlogs were higher than those for the preceding year. This may be due to the fact that more of the attractive large dimension sawlogs were offered for sale. On the whole, average stumpage prices for all roundwood seemed to have remained at the 1947/48 level.

Consumption: The government's four-year plan foresees increased timber exports. The housing program calls for a steadily decreasing percentage of buildings made of wood and a larger percentage made of brick. For this reason domestic consumption of lumber, which totaled 700,000 standards in 1947, fell to 550,000 standards in 1948.

Trade: Total 1948 exports of 545,000 standards were about 20 percent higher than 1947 exports. The destinations showing increases over 1947 levels were Australia, Egypt, Germany, Greece, Ireland, Netherlands, Union of South Africa, and the United Kingdom.

Prices: As a result of negotiations with the Swedish Wood Exporters Association concerning 1949 shipments, the British Timber Control came to an agreement with respect to prices for the purchase of 225,000 standards in normal British specifications if available from sellers. After 1 July 1949 both parties were free from any price commitment. The new prices are £42 10s. for 7″ u/s redwood battens, the 1948 price being £43; £49 10s. for 7″ redwood boards, the same as the 1948 price; and £41 10s. for 7″ whitewood battens for which the 1948 price had been £42 10s. It is said that the 1949 price list for British specifications is equivalent to an average reduction of about 4 percent from 1948 prices. As in the Finnish-British agreement, the price list agreed on is a step towards restoring the spread of prices that previously existed between the higher and lower grades of lumber.

EUROPEAN IMPORTING COUNTRIES

Belgium

Demand: In 1948 only half of the set building program goal of 30,000 dwellings was reported to have been attained; the goal for 1949 is again 30,000 dwelling units. Reduced export levels lowered the demand for lumber for packaging. Consumption of all lumber in 1949 is expected to approximate 605,000 standards, of which about 240,000 standards are to be from domestic production.

Trade: Because of the reduction in demand, 1948 imports were only 85 percent of those of 1947. As the U.S.S.R. is able to deliver lumber of good joinery quality in dimensions which are difficult to obtain in large quantities from Sweden, importers are anxious to conclude satisfactory contracts with the U.S.S.R.

Denmark

Consumption in 1948 was smaller than anticipated. Shipyards were reluctant to make new purchases and egg shippers were reported making shipments in paperboard packages. Stocks, which had been low in 1947, increased about 50 percent but were still 30-40 percent below prewar levels. In 1949 consumption is expected to be at 1948 levels.

Trade: For seven years purchasers were required to purchase their entire supplies of Finnish lumber from specified Finnish mills. In the last quarter of 1948, 25 percent of the Finnish imports were freed from quota purchases and importers could purchase from any mill they chose. Distribution of 75 percent of imports from all sources had formerly been controlled but this quota is now reduced to 60 percent.

Trade agreements for 1949 provide for the import of 55,000 standards from Finland, in addition to 14-

15,000 standards which were undelivered in 1948, 45,000 standards from Sweden, and 10,000 standards from the U.S.S.R., i.e. a total quantity of 125,000 standards. Imports in 1948 amounted to 143,300 standards.

France

Prices: Roundwood prices continued to increase during the last quarter of 1948. While some of the price rises may be due to capital investments, expectations of a future rise in wholesale prices and in lumber prices may have supported the trend. Official basic prices of lumber were raised some 7 percent in October 1948. By the end of 1948 lumber prices seemed to have become stabilized and this continued throughout the first quarter of 1949.

Trade: During 1948 more than 70 percent of all softwood lumber imports came from the French zone of Germany, from which, in addition, softwood sawlogs were obtained in quantity. As long as imports from Germany continue on their present scale, there will be small interest in obtaining large quantities from other sources.

Italy

Demand: Private and public building activity in Italy remained at a low level during the last quarter of 1948. In the whole of 1948 softwood lumber consumption is estimated to have been about 35 percent of the prewar level. There was a rising demand for the better grades but lower grades were difficult to sell.

Trade: More than three-quarters of all lumber imports were obtained from Austria through bartering arrangements. It is expected that barter deals will be terminated shortly. Small quantities of U.S.S.R. lumber reached the Italian market in 1948.

Trade agreements for 1949 provide for the import of 43,000 standards of softwood lumber from Yugoslavia, 32,000 standards from the U.S.S.R., 16,000 standards from Germany, and 2,000 standards from Sweden.

Netherlands

Demand: In 1948 housing construction reached 35,000 units, although plans called for 70,000 units.

Trade: Sweden, Finland, Germany, and Czechoslovakia, in order of importance, provided some eighty percent of the softwood lumber imported during 1948. Of the 32,000 standards of lumber covered by the trade agreement with the U.S.S.R., some 15,000 standards arrived during 1948. This trade agreement expires in June 1949 and may be renewed, calling for larger quantities.

A new trade treaty with Austria specifies the delivery of 14,000 standards during 1949.

Switzerland

Demand: Consumption of lumber in 1948 declined slightly, but appeared to be about normal. Building activity for the year was some 60 percent higher than in 1947. A shortage of the higher grades of lumber persisted throughout the fourth quarter of 1948 and demands were difficult to satisfy.

Prices: Strict government controls over production, distribution and prices were removed on 1 October 1948 and replaced by a voluntary agreement between producers of roundwood and sawmill organizations.

Trade: The French zone of Germany supplied more roundwood to Switzerland in the last quarter of 1948 than had previously ever been imported during a whole year from that source. A trade treaty concluded with Yugoslavia calls for the export of some 2,000 standards of lumber in 1949. A new trade treaty has also been concluded with Czechoslovakia, involving the export of about 3,000 standards of lumber. It is expected that softwood lumber imports in 1949 will not exceed 11,000 standards.

United Kingdom

The announcement of the lifting of controls on almost all hardwood lumber consumption in March 1949 gave impetus to rumors of similar action pending with respect to softwood lumber, a subject of considerable comment in the trade.

Demand: During the fourth quarter of 1948 there was considerable building activity and the demand for wood for export packaging continued strong. In 1949 the proposed housing program will be curtailed.

Prices: The last quarter of 1948 saw no change in the prices paid for imports. The important 1949 agreements with Finland and Sweden have already been discussed, and as indicated, resulted in lower prices.

Trade: A striking feature of the 1948 import picture was the reduction of North American softwood lumber imports received. While actual imports were cut in half, purchases were cut 85 percent. Total 1948 imports declined 28 percent from the 1947 level.

Arrangements have been made to obtain in 1949 imports totaling 225,000 standards from Sweden, 190,000 from Finland, and 110,000 from Canada including unshipped balances on old contracts. In addition it is believed that some 160,000 standards may be obtained from Yugoslavia and some 70,000 standards from Poland. Additional supplies are due from Rumania, Germany, and Brazil. The 1949 purchases in Canada have to date only been for specialties; further purchases have yet to be made. The quantities which may be received from the U.S.S.R. still cannot be estimated.*

The report of the Keith Price Committee estimated that 1949 requirements of softwood lumber and sawlogs would be around 1,600,000 standards, but conditions have changed since the preparation of the report. Domestic fellings of conifers have been cut 50 percent; effective requirements are much lower. It is now believed that imports in 1949 will total about 1,100,000 standards of lumber and sawlogs. If this import level is to be attained, considerable further purchases must be made.† There is considerable agitation by the trade against the low level of imports from Canada. If the "dollar difficulties" can be resolved, Canada will remain a dependable source of softwood supplies.

*These are now reported to be over 100,000 standards.

†The latest ECA authorizations total $10 million for the purchase of about 28,400 standards from the United States and 40,600 standards from Canada. In addition, $2.26 million and $670,000 have been authorized for purchase of hardwood lumber and softwood plywood.

The Work of FAO

Seventh Pacific Science Congress

THE Seventh Pacific Science Congress was held at Auckland and Christchurch, New Zealand, from 2 to 23 February 1949, under the auspices of the Royal Society of New Zealand.

FAO was represented at the Congress by Marcel Leloup, Director, Forestry and Forest Products Division, R. W. Phillips, Acting Director of the Agriculture Division and J. L. Kask of the Fisheries Division, all of whom gave addresses.

Especially noteworthy for its fine organization, the Congress comprised sections dealing with Geology and geophysics; Oceanography; Zoology; Botany; Soil resources, forestry and agriculture; Anthropolgy; Public health and nutrition; Social sciences; and the Organization of research. Excursions during and after the Congress enabled delegates to visit the areas of most interest in their particular fields, both in North Island and South Island.

The Director of FAO's Forestry and Forest Products Division profited by the opportunity offered by the Congress to make contact with forest authorities in the Pacific region and to examine with them plans for the future work of the Division in that region. He toured extensively in New Zealand and Australia, and also in Indo-China and Malaya on his way to India for the Mysore Conference.

The following are extracts from a report on the Forestry Section of the Seventh Pacific Science Congress, prepared by the Organizing Secretary of the Section, C. M. Smith and forwarded to UNASYLVA by A. R. Entrican, Director of Forestry, New Zealand State Forest Service:

The Congress after a lapse of twelve years was held in New Zealand in February 1949. For the first time, a recognised Forestry Section of Congress was formally organized as part of the Congress Division of Soil Resources, associated sections being those of Agriculture and Soil Science. The association was a happy one and merits continuance as a permanent feature of Congresses. The traditional affiliations of forestry at such meetings seem to be with Botany and to a lesser extent with Zoology: but while these senior divisions of a Science Congress still have much to teach the forester, there can be no doubt that he now has a more extensive community of interest with his fellow users of the soil and its produce.

Forestry delegates found that Pacific forestry tended to be divided somewhat sharply into North Pacific forestry and South Pacific forestry, the two groups finding a community of interests in those forest species which the southern group had for a century past been introducing and acclimatizing from the North Pacific forests. Twenty years ago a visiting forester could do no more than compare *Pinus radiata* trees with the same species as he knew it in natural relict stands, or in other regions where it was growing as an exotic. Rates of height growth were a yardstick for comparison; occasionally comparative volume-for-age results were a better one; general thrift or its absence, and occasional parasite incidence served for ancillary comparisons. So long as a planted crop is in its initial rotation stage, even so long as it is in the stage of a second or even a third rotation on a regime of clear-felling followed by artificial regeneration, these yardsticks are adequate. But the visitors on this occasion saw thousands of acres that had been burned and that had regenerated completely without further aid, more thousands that had been clearfelled without thinning and had regenerated to differing stocking densities, more that had been Borrgreve-thinned from the early age of 11 years and were now awaiting a final felling in 5, 10 or 15 years' time. The yardstick had changed from the dimensions of the individual tree or group of trees, to the facies of the stand or even of the forest area. Whole countrysides were seen where the dominant vegetation was *Pinus radiata*, not merely struggling for dominance as a tree in planted rows competing with circumjacent vegetation, but having achieved dominance over that vegetation, reproducing itself after cutting or burning, and invading in places open enclaves of non-forest land. Local foresters could not complain of any lack of interest on the part of their visitors.

Two trees showing record dimensions for *Pinus radiata* so far as is known were still available for recognition by their human fellow countrymen — the 182 ft. high specimen near Nelson and the 18 ft. 6 in. g.b.h. specimen in Marlborough. Both were accorded the meed of admiration, photography, and mensuration due to record-breaking veterans: but it was abundantly apparent that neither veteran would be viewed by many more Congresses. Both were long past their prime, and since neither could be over 70 years of age, they were good evidence of the brevity of the life span of the species in southern sites. This characteristic brings many problems in its train for forest management. The short rotation that seemed so desirable to the silviculturist and the forest financier can very easily leave the forest manager with a glut of unsold stumpage which cannot be held long in the timber reserve of accepted policy. An accelerated and expanded policy of produce disposal is the only way to avoid waste with such a crop of short durability. Although there was no time for Congress delegates to work out the implications in all their details, enough was evident from the passing inspection to give sharper local point to the plea of Marcel Leloup, FAO's Forestry Director, for a closer rapprochement between forest administrators and forest exploiters. With a large volume crop obtainable in a very short rotation period, there is less room for "caginess" on the one part or vandalism on the other. Damage done by overcutting can be more speedily repaired than in the more usual longer rotation crop; but more important still is the fact that the shorter time-interval between establishment and exploitation enables each to appreciate the other's problems more readily.

The exotic forests of the country therefore provided food for thought and discussion over a very wide range of forestry subjects, although naturally there was neither time nor opportunity for anything like full discussion of them all. Detailed treatment in session was given to one phase only. G. B. Rawlings presented an entomological paper dealing with recently observed developments in the *Sirex noctilio* population of *Pinus radiata* forests in New Zealand. His finding, in effect, was that the single controlling species (*Rhyssa persuasoria*) imported was in itself, though now abundant, incapable of controlling *Sirex* under New Zealand conditions and should be reinforced by a co-parasite (*Ibalia* sp.) which had purposely been passed over in favor of *Rhyssa* when importations were being made. The necessity for preparing the way for biological control by meticulously hygienic forest management was abundantly stressed.

These were the purely local aspects of the Congress, inevitably bulking large by their novelty to visitors and almost obtruding into the formal routine program, where an effort was made to keep a Pacific bias on discussions in preference to the local bias imparted by the venue of the meeting. Formal forestry meetings were opened by a short address by the Chairman, Dr. H. H. Chapman of the United States of America, in which he narrated his still fresh first impressions of a New Zealand kauri, *Agathis australis*, forest. A quick resumé of field symptoms indicating its probable amenability to silviculture and accelerated reproduction led him on to matters involving the all too frequent conflict between the conservation doctrine of inviolacy in isolation, and the other conservation doctrine of utilization of induced and accelerated reproduction and of improved forest hygiene — a subject which was locally topical and applicable to the forests in question, but equally relevant and topical, as he showed, to large forest tracts on the American continent; and apparently equally topical, as subsequent discussions with other sections of Congress showed, for Pacific Island forests in Polynesia and Micronesia.

The Forestry President's address followed by Leloup's exposition of the lack of increment in the virgin forests of Latin America and other unexploited natural forests apparently failed to impress the advocates of complete closure, while a subsequent pair of modestly phrased papers concerning tropical forestry in the Pacific area (Allsop on "Taungya in the Forests of Burma" and Marshall on the "Forest Land Problem in Fiji") drew adverse comment from exactly the opposite point of view because of their advocacy of longer periods of closure of forest land from shifting cultivation and temporary (often trespass) grazing. Allsop gave a very lucid, impartial, factual exposition of the growth and use of the taungya system of forest formation in Burma, an exposition such as it has seldom been the privilege of temperate country foresters to hear. He summed the story up in his conclusion that "about the nineteen-thirties, the post-1918 enthusiasm for taungya of all sorts gradually ran out. It was seldom successful except for teak." He indicated how, with a restricted area of land available for taungya, the shifting cultivators' agricultural rotation was apt to call on the compartment for a second burn and a second agricultural crop, before the foresters' rotation for the forest crop was nearly completed, the forest crop in that case becoming a total loss and its cost of formation and attention so much nugatory expenditure.

The foresters' conclusions that shifting cultivation was evil in its effects on forest soils and that taungya cultivation had not proved an adequate palliative of the evil did not secure complete agreement from soil scientists, at least one of whom appeared to argue for the continuance of a necessary evil with the deliberate sacrifice of forest expenditure to maintain it. No one ventured even to suggest any possible remedy for the position in Fiji, which is experiencing the impact of two differing races on a somewhat rigid system of forest land tenure that does not allow for forest reservations, and where persistent trespass is complicated by necessary consideration for religious scruples against cattle destruction.

These discussions together with five other descriptive papers, which were read in part only, represented all the attention that the Congress was able to give to tropical forestry in the Pacific area. It was felt by all that this was inadequate for a very important subject; but, as is the experience of most congresses, tropical forestry presents such a different set of problems from temperate forestry that it is impracticable to do justice to both at one Congress. The emphasis and interest must fall on the type of forest and the stage of forest development found in the locality where Congress is held. Even of generalized basic principles of policy, very few are common to tropical and to temperate forests. The papers relating to the Philippine Islands (three), New Hebrides (one), and Papua (one) were therefore read only in part or merely tabled at the Congress.

Heather's Papuan contribution in the shape of what was virtually a monograph of *Eucalyptus deglupta* was of general scientific moment in circles beyond the forester's orbit and, dealing as it did with the only significant species of the genus that grows naturally beyond the limits of Australia, was an excellent and relevant complement to the general paper on "The Genus Eucalyptus — Its Past and Its Future in Pacific Forests" presented by N. W. Jolly. It is not unfair to other contributors to record that, in the opinion of most forestry delegates, Jolly's paper was *facile princeps* of all the forestry papers presented to the Congress. Its expansion into a volume on eucalypts and their silviculture would be an objective worthy of any endowment for scientific purposes that might become available for Pacific forestry, and the result would probably be the greatest contribution that Australia could make to world forestry for many years to come.

In another paper presented to the Congress — Smith's "Acclimatization versus Domestication of Forest Species" — the point was made that "the genus *Eucalyptus* conforms remarkably to all prerequirements for silvicultural attention . . . but is still a silvicultural enigma." This paper arrived at the conclusion that the genera *Eucalyptus* and *Nothofagus* "might readily in future forestry of the southern Pacific play the role that *Pinus* and *Picea* play in northern Europe." The amplification of Jolly's eucalypt paper into an authoritative monograph of the requirements of the different species of the genus in nature and under cultivation, so far as these are known to date, would mark the beginning of such an advance in Pacific forestry.

Other papers presented at the Congress by Poole and Holloway respectively gave results of local work to date on the other important genus *Nothofagus*, which occupies significant areas of natural forest in Australia, Chile, and New Zealand. So far it has nowhere proved amenable to cultivation beyond its natural boundaries, but in each country where it occurs these boundaries are so wide and include land so apparently hostile to uses other than forestry use that it seems to be of the highest importance to unravel the cultural secrets of the various species. Poole's paper dealt largely with current research on the floristics of the local species, an aspect which is still, after a century of botanical work, very imperfectly known, but which plainly must be fully investigated before the ecology begun, as described in Holloway's paper, can be pursued to a full exposition for all species of the genus.

Holloway's paper entitled "Ecological Investigations in the *Nothofagus* Forests in New Zealand" made a fitting finale to the Forestry Section of Congress. By the time it was presented, most visiting delegates had had opportunities to gain some idea of the extensiveness of the tracts of *Nothofagus* forests in the central core of both islands; some had seen the precarious hold that many of these forests had on unstable skeletal soils at the headwaters of large river systems; some had viewed the timbers of the better beech species in timber yards and joinery factories; some saw immediately after the paper the abundant and dominating beech regeneration that could be secured after moderately careful exploitation of the stands in the best beech environments. Holloway's detail picture of *Nothofagus* in a small portion of New Zealand was a worth-while companion to Jolly's picture of *Eucalyptus* on a much larger canvas. They were both arresting signposts to probable South Pacific forestry of the future.

These were the technical aspects of forestry dealt with by the Congress. There was, however, an administrative aspect where results were less conclusive. From the time of the last Congress almost twelve years earlier, there had been a Standing Committee on Pacific Forestry. None of its surviving members was able to attend the Congress but a short report was forwarded by the Secretary of Committee. The report stated that all collected data for previous Committees had become war casualties in the Philippines and in China. Questionnaires of the usual pattern had been sent out recently to all affected countries, but no assembly of resultant data had yet been achieved, nor had all countries found it possible to reply in the time available. Leloup, Director of the Forestry Division of FAO, expressed the fear that it might readily prove that the questionnaires of the Standing Committee and the assembly of resulting data would be a duplication of similar information likely to be sought by FAO for the Pacific area. He indicated, however, that any proposals to prevent overlapping and duplication of work would secure his careful and favorable consideration.

Third World Forestry Congress

THE Third World Forestry Congress, sponsored by FAO and organized by the Government of Finland, was opened on 10 July by President Paasikivi and Prime Minister Fagerholm. Over 300 delegates attended from 28 countries, including Sweden's Minister of Agriculture and the Soviet Union's Deputy Minister for Wood and Paper Industries. Germany and Japan had representatives present and there were 200 specialists in various fields from Finland itself.

At the opening plenary session, the Congress elected Professor Eino Saari as Chairman and some 30 other officers, prior to breaking up into five sections to start the substantive work of the meeting.

The Congress, the first full gathering of foresters of the world since the end of the war, will be treated more fully in a later issue of UNASYLVA.

Fourth Session of the ECE Timber Committee

THE ECE Timber Committee of the United Nations Economic Commission for Europe held its Fourth Session at Geneva from 7 to 10 March 1949. FAO actively co-operates in the Committee's work, and the secretariat is provided by a joint ECE/FAO staff.

Having reviewed the 1948 situation, experts from 20 countries concluded that member governments had substantially complied with the Committee's recommendations. It had been possible in 1948 practically to cover effective demand for softwood lumber, to absorb all available export supplies from European sources except for very small quantities of lower grade timber and unsuitable specifications, and greatly to reduce imports of timber from dollar sources.

Europe's production of sawn softwood attained 6.5 million standards in 1948, a 5 percent increase over the previous year. Europe's major softwood exporting countries raised shipments to 2 million standards, timber going to European destinations amounting to 1.80 million standards compared with 1.66 million standards in 1947. Exports to other continents showed an increase of 120,000 standards. European exporters participating in the Timber Committee had undertaken to place a maximum of 1.37 million standards on the market. Their actual exports in 1948 were 1.40 million standards, showing that the pledges had been kept and were even slightly exceeded, despite the fact that the equipment loans, which were the condition for these engagements, had not yet been signed.

Over 80 percent of Europe's import requirements in 1948 were covered from European sources. The proportion of North American imports dropped from 35 percent to below 20 percent.

Softwood stocks in Europe were almost 10 percent lower at the end of 1948 than twelve months earlier.

Forward estimates of import requirements for 1949 and 1950 revealed a rising trend in effective demand, which would require an expansion of softwood production and further increases in exports. This rendered particularly important the early conclusion of the timber loans and the procurement of timber equipment from European sources.

The Committee described the forward estimates of requirements as somewhat misleading and considered that stated import programs might not be fully implemented. It also believed that a slight increase of exports over announced figures was likely to take place. It observed that Canada and the United States were in a position to meet practically the whole of any possible European deficit, although this would involve increased dollar expenditure for Europe. It also noted a gradual resumption of timber exports from the Soviet Union.

No importing country anticipated any major difficulty in finding the timber it would be able to buy, and European exporting countries expected to sell all export production. Accordingly the Committee decided that, at this stage, buying limits for imports, as in 1948, were not needed for 1949. It agreed, however, to reconsider the need for such a measure at its next session.

As regards pitprop supplies, the Committee declared that there seemed no doubt that supplies in 1949 would be fully sufficient to cover requirements.

A progress report on Mr. Campredon's study on "More Rational Wood Utilization" was received. The primary purpose of this study was the achievement of technical improvements in wood utilization. It did not seek economies through a reduction in quality or standards, nor through the substitution of wood by other materials. The report stressed that measures for rational timber utilization should always be taken with due regard to the general economic conditions and prevailing customs in each country.

Preparatory Conference on World Pulp Problems

THE Preparatory Conference on World Pulp Problems, held in Montreal from 25 April through 4 May 1949, was sponsored by FAO and the Canadian Government, and organized with the assistance of the Canadian Pulp and Paper Association. The Conference was the first of its kind to bring together in one meeting important industry and government representatives from the bulk of producing and consuming countries, and it will be reported on in greater detail in the next issue of UNASYLVA.

The salient fact to emerge from the Conference was that the estimates showed approximate balance between world production and requirements for 1948-55. If these figures are confirmed by later developments, there should be no major wood pulp deficit during the period under review. The estimates suggest that by 1955 world production will have climbed from 28 million metric tons to approximately 36 million.

This approximate balance between supply and demand, it was stressed, had only to do with *effective* demand as measured by ability to pay. It is obvious that in many parts of the world people are suffering from shortages of paper and other pulp products.

Last year's pulp production in Europe was not quite two thirds of prewar, but by 1955 Europe expects to regain 90 percent of its prewar output. This would require approximately 48 million m^3 of pulpwood, which exceeds European pulpwood supplies by 3.4 million m^3. The hope of regaining a large part of prewar output exists in spite of the fact that for the continent of Europe, taken as a whole, forests are at present being overcut to the extent of 20 percent of annual growth. In prewar years, European pulp industries relied on an annual import of 3 million m^3 of pulpwood, which came almost entirely from the present area of the Soviet Union. The Conference felt that the resumption of pulpwood exports from that area on the prewar scale is unlikely. In that case, Germany, France, and, to a smaller degree, the United Kingdom and Switzerland might be compelled to reduce their production below 1955 estimates. It is possible that an increase in raw material supplies in European mills can be achieved to some extent by greater utilization of sawmill waste, greater use of hardwoods and alternative raw materials, and the introduction of high-yield pulping methods. It is for this reason that the Conference recommended that new emphasis be given to these possibilities for increased raw material supplies.

An address by FAO Director-General Norris E. Dodd and a message from Torres Bodet, Director-General of UNESCO, were features of the Conference. Mr. Dodd outlined the main elements of the world situation, which finds pulp consumption largely concentrated in the technically advanced countries, and Mr. Bodet drew attention to the serious social and political repercussions of inadequate supplies of newsprint and printing papers which exist in many lands and form effective barriers to the development of education, restrict freedom of the press, and hamper healthy political growth.

The Conference recommended that FAO keep the world pulp situation under continuous review and consider the time and place of any further international wood pulp conferences. It also recommended the collection of more complete pulp and paper statistics and urged that arrangements be made for the necessary exchange of information designed to give FAO the benefit of available material with the least delay and the least additional work to governments and industrial associations. Another recommendation was that FAO undertake special efforts toward the standardization of national wood pulp and pulpwood statistics so as to improve their international comparability.

The Conference reported that in 1948 world production of wood pulp reached an all-time high of about 28 million metric tons. A number of new mills were under construction or in an advanced stage of planning in North America, Latin America, and Oceania. In Europe and Japan efforts were being made to restore, as far as possible, prewar capacities of the pulp and paper industries. Toward the end of the year, however, the

world market for pulp was beginning to show signs of at least temporary saturation.

There was general agreement that there will be a continuing rise in requirements for pulp and its products, but that on the other hand pulp producers were sometimes meeting difficulty in selling their products and in consequence questioned whether supplies had caught up with or even surpassed effective demand. The recent change-over from a sellers' to a buyers' market was accompanied by price reductions for all grades of wood pulp. The situation was complicated by currency and exchange problems as well as by lack of purchasing power in many countries.

In one sense, the Conference agreed, world needs for the products of pulp — newsprint, other printing and writing papers, wrappings, packaging material, and textile fibers — were far greater than existing supplies. However, the Conference also noted that physical limitations as well as the economic and financial problems connected with the acquisition of desirable supplies stood in the way of meeting all consumer needs.

Attention was directed to the fact that the war brought about a major change in the distribution of pulp production and consumption as between different regions of the world. North America, which in 1937 produced 44 percent and consumed 51 percent of the world output, now produced 68 percent and consumed 71 percent. Production and consumption in Europe, on the other hand, had fallen from 50 percent and 42 percent respectively in 1937 to 27 percent and 25 percent in 1948. The relative and absolute importance of consumption in Asia and the Far East had been reduced, largely because of the changed situation in Japan. In Latin America and Oceania large percentage increases in output had occurred, but the tonnages in both regions were small in terms of world production.

The Conference was unanimous in appreciating the importance of adequate paper supplies for mass education and information and agreed that larger paper supplies for these purposes were eminently desirable. Many delegates expressed the opinion that an assessment of present and prospective consumer needs would constitute a valuable supplement to the Conference report, and suggested the preparation of a study of the facts by FAO, in co-operation with UNESCO, to be presented to the next annual FAO Conference in Washington in November.

The following 20 governments sent delegations to the Montreal Conference:

Austria, Australia, Canada, Chile, Ecuador, Finland, France, Greece, Guatemala, India, Italy, Mexico, Netherlands, New Zealand, Norway, Poland, Sweden, Switzerland, United Kingdom, and United States of America.

Governments and organizations represented by observers were:

Argentina, Belgium, Bolivia, Czechoslovakia, Denmark, Germany (Bizone and French Zone), Haiti, Poland, SCAP (Japan), Turkey, Yugoslavia, UNESCO, and International Labour Organisation.

News of the World

The items appearing here are condensed selections of news thought to be of interest to readers of UNASYLVA. *They are grouped alphabetically by countries under headings currently used by the Division of Forestry and Forest Products for reference purposes. The Editor will be glad to receive direct from readers authenticated items of interest and of news value for this part of the review.*

General

PERU

• A French Center for Andean Studies, under the direction of Dr. J. Vellard, assisted by Professor M. Pieyre, was founded in Lima in 1948. It is hoped that this will serve as a base for French scientists at present in Peru as well as enable French and Peruvian experts to keep informed of work being accomplished in Europe and America which concerns the Andes.

The Center includes a geographical, a biological, and an anthropological section. A number of points of basic interest for foresters appear in the present research program. They include research on erosion, climate, and soil utilization and the study of aerial photography. The Center is in liaison with the Commission for the Study of the Economic Potentialities of Peru.

SWITZERLAND

• The Swiss Wood Industry Association, the Swiss Association of Professional Timber Merchants, and the Swiss Association of Forestry Economy terminated their convention at Berne and Soleure on 10 February 1949 by creating an autonomous mutual assistance fund. This fund is financed by a special contribution paid partly by the owners of public or private forests at the rate of 10 centimes per m^3 and partly by the purchasers of rough logs at the rate of 20 centimes per m^3. It is managed by a special Commission composed of representatives of the three signatory Associations, plus a representative of the Swiss Forestry Society, and is presided over by the Inspector-General of Forests of the Confederation, who acts in an advisory capacity.

One-third of the available money will be utilized in studying problems relating directly to forestry economy, particularly the improvement and rationalization of forest exploitation and wood transportation, and in seeking market outlets for wood products of lesser value. One-third is intended for use in the improvement and rationalization of the lumber industry, particularly for better professional training and the development of the use of sawlogs. The remaining third is to be set aside for dealing with common problems and regional matters pertaining simultaneously to forestry economy, industry, and timber trade.

YUGOSLAVIA

• After a lapse of six years, the Annals of Experimental Forestry published by the Agronomo-Forest Institute of Zagreb University in Yugoslavia have made a welcome appearance again. The last issue (Vol. 8) came out in 1942. The recent issue (Vol. 9) was published in 1948. It is a large volume of 366 pages containing eleven high-grade scientific papers covering a wide range of subjects from the biological characteristics of mixed stands of alder and oak to the general principles of determining stumpage prices, and from propagation of cottonwood by cuttings to the technical properties of the wood of the different pines. The articles are accompanied by brief accounts in German or French, sometimes both, and an occasional article has an English resumé. On the whole, the publication is a record of creditable forest research, and foresters everywhere will be glad to know that the Agronomo-Forest Institute is again actively engaged in forest studies and research, the results of which help to enrich the science of forestry the world over.

• Four forest research institutes came into being in 1948 in the several federated republics of Yugoslavia, with headquarters in Belgrade, Zagreb, Ljubljana, and Skoplje. They are under the direction of the forest departments of the respective republics. In addition, there is an All Union institute, with headquarters in Split, devoted to the development of improved methods of forestry on rocky soils.

UNION OF SOVIET SOCIALIST REPUBLICS

• The Kuriles Archipelago comprises some 36 small islands stretching all the way from southern Kamchatka to the northern tip of Japan (Hokkaido). Originally the islands belonged to Russia, but after the Russo-Japanese War they were ceded to Japan, together with

southern Sakhalin; after World War II they again became part of the U.S.S.R. They occupy an area of 15,600 km^2, and have a population of some 6,000. The forests that exist are found mostly on the four southern islands — Urup, Iturup, Shikotan, and Kunashiri. The amount of standing timber is relatively small. From the possible exploitation standpoint, the spruce (*Picea jezuensis*) and fir (*Abies sachalinensis*) forests are of interest. The spruce is prevalent mostly on Kunashiri Island (25 percent of the entire merchantable stand); it occurs also in small amounts on Shikotan Island. In the northwestern part of Kunashiri are found high-grade spruce stands, often two-storied forests with fir and other species forming the lower storey. As the Japanese had for years been cutting out the spruce, many of the stands have now become mixed forests of fir and spruce, with fir predominating, or pure fir forests. Spruce has an average height of 18 meters, and occasionally reaches a maximum of 35 meters, with diameters of 28 to 72 cm. The age ranges from 80 to 250 years. There are no continuous massive forests; the narrowness of the islands alone (from 6 to 46 km. wide) precludes such occurrence.

The main controlling meteorological factor of the generally humid climate of the Kuriles is the strong winds. The forests attain normal development, therefore, only in places sheltered from the wind — on protected slopes and in valleys and coves. The timber line stops at an elevation of 400 to 500 meters above sea level. Above that occur only procumbent pine (*Pinus pumila*) and shrubs. Some good stands possible of exploitation occur in isolated coves opening directly on the ocean and only in a few cases connected by dry land along the shore with the settlements. Mild winter temperatures (the average annual temperature is 4.5 degrees C.), luxuriant grass cover, bamboos, abundant precipitation, and numerous mineral springs keep the ground soft in winter, and this makes logging difficult. On the northern islands of the Archipelago there are only isolated groves of alder, willows, and occasional birch growing in places sheltered from the killing cold winds. The economic importance of the forest growth is insignificant. The intermediate tier of the small rocky islands has even less timber growth.

Silviculture and Management

Hungary

• The old German yield tables for oak forests, which were long used in Hungary, have been found no longer applicable to present Hungarian conditions. For this reason, Prof. Fekete Zoltan of the Hungarian Technical University in Sopron has undertaken the preparation of new yield tables for oak forests, based on permanent sample plots located in the oak forests of Hungary. The measurements were made on 126 sample plots, each plot averaging 0.5 hectares. Of these, 69 plots were in high (seedling) oak forests and 57 plots in coppice forests. These yield tables, separately for the two kinds of oak forests, have now been published in Volume XLVI of the Forest Investigations of the Sopron University.

India

• A report on "Seed Storage with Particular Reference to the Storage of Seed of Indian Forest Plants," by T. V. Dent, is contained in Indian Forest Records, *Silviculture*, Vol. 7, No. 1, published at Dehra Dun. Comprehensive knowledge of the methods of seed collection, storage, and treatment of the large number of tree species involved is needed since at least 8,100 hectares (20,000 acres) of forest land are regenerated artificially every year in the various provinces and states of India and since reforestation of denuded areas is a subject of growing national interest. The first part of the report deals with general principles of seed storage, such as germination of seeds, dormancy, duration of viability, collection and extraction, methods of storage, protection of stored seeds from pests, transportation, and testing. The second part summarizes all available information on the duration of seed viability and the storage of seeds of 237 species of Indian forest trees, tabulated alphabetically by species. The seeds of closely related species tend to be similar in longevity and keeping qualities.

Puerto Rico

• The success and usefulness of the selective method of cutting in tropical forests have been amply demonstrated by a small 20-hectare (50-acre) forest located in the interior of Puerto Rico in the midst of denuded hillsides on which tobacco is grown. When this forest was purchased as part of a farm in 1926, it was as degraded as all the other forests of this overpopulated island. Since that time it has been treated by a jardinage type of forestry based on a common-sense approach, the owner having no specialized knowledge of silviculture but rather depending on his own experience. The area has reacted remarkably to this wise handling, which even included an accurate inventory of the more valuable tree species. It contains an excellent proportion of the best local species: Ausubo (*Manikara nitida*), Tabonuca (*Dacryodes excelsa*), Granadillo (*Buchenavia capitata*), Motillo (*Sloanea berteriana*), Capá prieto (*Cordia alliodora*), etc., as well as trees suitable for the production of poles. The trees are straight, well-formed and correctly spaced, and there is an abundance of seedlings. The entire area is surveyed annually to mark trees for felling and all the products are used to the greatest possible extent, any wood which is not suitable for any other use being converted into charcoal.

The owner believes that his forest is the most productive part of his farm. Up to 1940, it brought him an average of $1,000 per year, and from 1940 to 1944 this figure rose to $1,500, more than half of which is clear profit. This example deserves to be called to the attention of all countries of tropical America.

United States of America

• For several years experiments have been carried out on lessening the transpiration of young plants immediately after planting, in order to give them a better chance of survival. The insulating emulsions used hitherto have not always been successful. Various experiments have recently been conducted by the Federal Forestry Service in Minnesota, Oregon, and at the Northeastern Experiment Station with a product named "S/V Ceremul C," manufactured by Socony Vacuum. This is a wax and water emulsion with triethanolamine as an emulsifying agent.

For the most part, these experiments were tried with young Ponderosa pine plants (*Pinus ponderosa*), using varying dilutions of Ceremul in water; to some of these formulas clay was added. The upper portions of the young plants, in bunches of 50 are dipped into the solution. Too highly concentrated solutions, while assuring a better percentage of survival, decrease plant vigor, probably because leaf functions other than transpiration are partially impeded. However, by using one part of Ceremul to 4 to 6 parts of water, an increase in the rate of survival as high as 14 percent was obtained. For heavily transpiring species, such as Douglas fir, the best dilution seems to be one part of Ceremul to 10 parts of water.

• Since 1932 the Lake States Experiment Station has been conducting experiments on the storage of white pine seed, *Pinus strobus*. These experiments are particularly important because the white pine bears seed only every three to five years and, because of its high oil content, the seed requires particular storage precautions. Experiments conducted under five different temperature conditions and five different degrees of humidity have indicated that the best method of preservation consists of drying the seed until it contains no more than 7 percent moisture and then storing it in moisture-proof receptacles at a temperature of 36°F. (2.22°C). Under these circumstances, the seed retains its viability for at least ten years.

Forest Protection

India

• Shifting cultivation, so extensively practiced in most tropical countries, is characteristic of the East Indian States, where it operates primarily at the expense of the sal forests, *Shorea robusta*. Under this system of cultivation the cleared forest areas are planted to crops for two or three years, and the land is then abandoned for 8 to 10 years, or even for as long as 30 years. This practice leads to deterioration of vegetation and soil, the deterioration being more rapid as the rotation cycle is shorter.

The problem which foresters have encountered in persuading the inhabitants to abandon this primitive system of agriculture is the difficulty of finding land suitable for permanent cultivation in the vicinity of these communities. In some cases, this has been possible. In others, the location of the community has had to be shifted; the distance that a community can be moved, however, is limited by religious traditions which have to be respected. In either case in each experiment of this nature so far undertaken in East India a redistribution of land was carried out, each family receiving cultivation plots consisting of from 2 to 2.4 hectares (5 to 6 acres) of wet paddy land and 0.8 hectares (2 acres) for dry cultivation. The remainder of the land was divided as follows: (1) Class A, for-

est reserves intended either for commercial exploitation or protection; (2) Class B, forest reserves set aside for supplying the wood requirements of the villages, where pasturing of flocks is authorized against payment of fees; and (3) village grazing lands. The first two types of forest lands are placed under management.

In order to obtain satisfactory results, material assistance must be given. In the East Indian experiments, draft cattle, paddy seed, basic agricultural implements, and housing timber were given gratis to each family. Reservoirs and irrigation canals were constructed at State expense. A loan of rice was made to tide the villagers over until the work required for providing them with new land was completed. The villages were equipped with dispensaries, schools, and a course was given to teach farmers the principles of their new type of agriculture, particularly marshland cultivation. Despite the initial outlay involved, the results obtained in some instances are promising, even from the financial standpoint. In the State of Rairakhol, an experiment of this type which included 83 families cost 18,000 rupees, and was financed entirely from the forestry budget. The annual income derived from rented lands amounts to 600 rupees, and in addition the sale of bamboo from 4,000 hectares (10,000 acres) of reserve forest land brings in 1,400 rupees annually.

UNITED KINGDOM

• The United Kingdom Forestry Commission recently published the first practical results of a reforestation experiment which was begun 20 years ago under particularly difficult circumstances, involving a stretch of 970 hectares (2,400 acres) of moving sand dunes on the Carmarthenshire coastline in South Wales which are exposed to extremely violent winds.

After many attempts, afforestation was begun, using Corsican pine (*Pinus nigra var calabrica*) with a small mixture of Austrian pine (*Pinus nigra var austriaca*), *Pinus contorta*, and spruce. Corsican pine proved highly successful because the root system of this species grows very vigorously. The plants were supplied by a small nursery located in the vicinity of these sand dunes. At first, two-year-old plants, transplanted after one year, were used, and later on, three-year-old plants which had been transplanted for two years. The plants were fairly closely spaced, 1.30 meters (4 feet 3 inches) apart in each direction. The fringe trees with their lopped-off crowns and wind-twisted trunks afforded excellent protection to the remainder of the plantations. The stands were originally assisted by seeding or planting with marram grass (*Psamma arenaria*, a native species), sand sedge (*Carex arenaria*), creeping willow (*Salix repens*), sea buckthorn (*Hippophae rhamnoides*), and other stabilizing species.

The first thinnings were recently made in this plantation, which is now the forest of Pembrey. They produced a large quantity of posts and small pitprops. An interesting feature is that after twenty years of protection against wind and sand, together with proper drainage, the land situated immediately behind this forest has been transformed from unusable wasteland into first-class agricultural land.

• Interesting observations have been made from the examination of the roots of various conifers growing in stands near Oxford, which had been severely damaged by wind during the winter of 1946. Drainage conditions were bad. Dead secondary roots were numerous in the waterlogged soil layers that have been intermittently inundated for long periods of time, but they were less numerous in the upper soil layers that have sometimes been seriously affected by drought. It appeared that the early stages of disease were not necessarily, indeed only rarely, produced by fungi, which later became extremely abundant throughout the root system and caused butt rot in the main stem. A young Douglas fir (*Pseudotsuga taxifolia*) infected by *Fomes annosus* clearly demonstrated that the partial dying of its roots had been caused by nonparasitic factors; growth recovery followed and was quickly succeeded by infection. These observations support the theory that physical condition of the soil, particularly air and water circulation, directly influence the development of infections which cause the roots to die and the tree stocks to decay.

UNION OF SOVIET SOCIALIST REPUBLICS

• The long-range conservation plan announced by the U.S.S.R. last November is being pushed with a great deal of zest. Practically all institutions of higher learning are participating in the realization of one or another phase of it. Six expeditions, comprising 120 specialists from the National Academy of Sciences, the biological faculty of the Moscow University, the Forest Institute of Leningrad, the All-Union Institute of Agromelioration, and others, are now in the field determining the location of the sites on which the eight long and continuous protection zones are to be created.

In the fall of 1948 the collective and state farms, chiefly in the Ukraine, have planted 199,000 hectares of forest strips around the cultivated fields.

In the prairie and semi-prairie regions, some 2,242,000 hectares of the natural forests still found there in some places favored by special conditions of soil and moisture have been declared reserve forests to be handled with special care.

Some 1,869,000,000 seedlings were made available for the large-scale forest plantings in the spring of 1949.

Some 7,825 tons of seed of forest trees, shrubs, and fruit trees have been collected in the prairie and semi-prairie regions; of this amount 6,225 tons are acorns. Close to 10,000 hectares were allocated for use as forest nurseries in the spring of 1949.

To increase the number of qualified specialists, the Ministry of Education decided to increase the annual enrollment of students in the Forest and Agricultural Schools of higher learning in 1949 by 1,025 and in the technical schools of medium standing by 4,180; the graduating classes of specialists in agro-melioration and forestry are expected to include 1,650 persons from universities and 3,440 from technical schools.

Utilization—New Methods

CANADA

• The renewal of competitive conditions in the paper and pulp industries has stimulated efforts to improve quality. A manifestation of these efforts in the field of wood pulp is a new process, reportedly developed in Canada, in which the fibers are curled. This technique is said not only to widen the range of quality obtainable from pulp but also to increase the yield by as much as 10 percent. While announced results apply to the sulphite process, similar achievements are reported in producing kraft, soda, and groundwood pulps by the same method.

Economics and Statistics

CANADA

• Studies conducted by a large life insurance company indicate that the index of fatal accidents among lumbermen and loggers is 286, taking the average number of accidents in all occupations as the indicator 100.

INDIA

• India has several development projects of comparable size and value to that of the Tennessee Valley Authority. The Mahanadi Project is among the most important of these. It consists of three dams (Hirakud, Tikarpara, and Naraj) which are expected to irrigate over 8 million hectares of land, to generate 4 million kilowatts, and permit a 611-kilometer (380-mile) navigable waterway from the border of the Central Provinces to the sea. The Dam of Hirakud alone, 14.5 kilometers (9 miles) upstream from Sambalpur, will submerge a surface area of approximately 54,000 hectares, half of which is under forest or pasture. The Indian Forester calls the attention of foresters to the influential role they should play in the creation and realization of these projects. Not only must the wood in forests which are to be flooded be used, a particularly difficult task, but also an area of forestland adequate for the protection of the catchment basin must be set aside. Also, to assure soil conservation, a state of equilibrium between agricultural lands, pasture, and forest lands must be established during the land utilization process. In addition, canal sides should be planted with trees, fuelwood resources be created, and construction timber provided for the new industries to which these projects will give rise.

It is hoped that all interested States and Provinces will insist on the assignment of local forest officers to these projects so that the plans to be implemented will be properly co-ordinated.

MALAYA

• The following statistics on Malaya were made available at the Mysore Conference:

A. Area

	km^2	*sq. mi.*
Total area	131,676	50,840
Total forested land	100,407	38,767
Total reserved forest	28,104	10,851
Percentage of reserved forests to whole area		21.3
Percentage of other forests to whole area		54.9

B. Production of Forest Produce

	1947		1948	
	1,000 cubic feet	*1,000 m³*	*1,000 cubic feet*	*1,000 m³*
Timber, round (logs)	16,620	471	19,014	538
Timber, sawn (lumber)	3,897	110	2,984	85
Poles	3,365	95	3,395	96
Firewood	16,959	480	13,091	371
Charcoal	3,952	112	4,406	125
TOTAL (equivalent in round timber)	48,690	1,379	45,875	1,299

C. Sawmills

(i) On 31 December 1947 there were 189 sawmills of all sizes operating in Malaya; on 31 December 1948 the figure was 187.

(ii) Most of the timber brought to revenue account as "round" (see *B* above) is sawn in local sawmills. Outturn figures were 241,571 tons (of 50 cubic feet) in 1947 and 271,618 tons in 1948.

(iii) About 28,000 persons are employed in the forest, working timber and fuel, and about 4,000 are employed in sawmills.

D. Exports

Total exports in 1948 amounted to 36,149 tons, valued at $3,984,464 ($ Straits = 2/4d. or approximately 50 cents U. S. currency). The table below gives destinations and compares the figures with those of 1946 and 1947.

Exports of Sawn Timber from Malaya, 1948
(including sleepers)

Destination	1948	1947	1946[1]
	Tons of 50 cubic feet		
China (Shanghai)	7,822	4,192	8,332
Hong Kong	2,287	4,003	4,098
Sumatra (Palembang)	5,640	1,441	331
Rioux and other Dutch Islands	2,186	604	382
India (Calcutta, Bombay)	911	-----	-----
Pakistan (Karachi)	884	308	-----
Iraq (Basrah)	233	660	-----
Aden and Bahrein	2,936	1,379	700
Arabia (Jeddah)	7,419	2,490	3,328
Egypt (Alexandria, Suez, Port Said)	145	200	-----
Kenya (Mombasa)	[2]1,460	-----	-----
Mauritius (Port Louis)	1,132	746	1,084
Sudan (Port Sudan)	179	-----	-----
South Africa (Durban)[3]	218	-----	-----
Australia (Sydney, Adelaide)[3]	363	62	-----
United Kingdom (London, Liverpool)[3]	2,226	65	-----
U.S.A. (New York)[3]	8	-----	-----
Other places	80	2	-----
TOTAL	36,149	16,152	18,255
Approximate f.o.b. value in $ Straits	3,984,464	1,907,098	2,583,026

[1]For 8 months only; export prior to May 1946 was prohibited.
[2]The whole quantity was in the form of creosoted sleepers.
[3]All timber to these markets was graded by the Department of Forestry.

Naturally there is a good deal of uncertainty in estimating supply and demand for so many years ahead, but the figures are considered to be realistic. The general opinion is that population will increase by immigration and natural increase at a maximum rate of 2 percent annually, which will give a total population of approximately 3,000,000 by 1975; if the domestic demand is somewhat higher than the figure allowed, it will not affect the export position to any extent as the surplus which has been quoted for export purposes relates only to the North Island forests. The South Island is not nearly so well forested, but there is nevertheless a small prospective surplus ultimately which will cover contingencies.

If the whole of the 1.4 million m³ (r) surplus were converted into sawn timber, it would yield approximately 708,000 m³ (s) (300,000,000 board feet) for export. However, utilization activities are being diversified, so part will be converted into pulp products. Although this surplus has been indicated as available from 1955 onwards, industrial expansion will not be rapid enough to make the whole available for export as early as that date. At the present time New Zealand is budgeting for an export of 330,000 m³ (s) (140,000,000 board feet) of sawn timber and 81,000 metric tons (80,000 tons) of pulp products by 1955; and these quantities, or at any rate the quantity of pulp products, will increase in subsequent years.

The keynote of the development of the exotic forests will be integration of manufacture, and it is understood that this will apply, to some extent at least, to the larger Company holdings as well as to the State Forests. Large sawmills equipped with gang-frames will be set up and integrated with plants for the production of chemical pulp, newsprint, and building board. The new sawing technique, in which the inherent accuracy of the North European gang-mill has been adapted to the conversion of the relatively small diameter logs characteristic of the exotic forest, was pioneered by the Forest Service when it opened its first unit at Waipa, Rotorua, in 1940. The reason for the entry of the State into this field was the realization that a conversion technique based on the rather primitive and inaccurate equipment used in the milling of indigenous timber was totally unsuited to the conversion of the very much smaller and generally more knotty logs predominating in the exotic forests; and that unless the advantages were actually demonstrated to the timber industry, inertia and the traditionally conservative outlook of the industry would merely lead to the perpetuation of the old technique and jeopardize the entire future of the exotic forests. Seeing is believing; and the timber industry in New Zealand is now persuaded of the unsuitability of the primitive equipment of former days for the sawing of exotic timbers.

The quality of product produced by the State Mill has been favorably commented upon, and the Forest Service has already introduced its sawn timber in limited quantities to markets in the Pacific area. The principal features of the State product are: timber sawn accurately to dimension, kiln dried to equilibrium moisture content, graded, trimmed, branded, and packaged. At present only the State Mill is in a position to offer timber fully to this standard, and then only in limited quantities for export; but new units which will be installed by private interests in the next two or three years are expected to follow the pattern of the State Mill in the type of sawing equipment and also in the quality of merchandizing. It might be mentioned that private sawmillers have been exporting small quantities of sawn softwoods which do not compare with the gang-sawn product; but as far as the export trade of the future is concerned, competition from both European and American countries will probably tend to restrict production to those millers who adopt a high standard of sawing and merchandizing. This means that export will tend to be concentrated in a few relatively large and well-equipped mills in much the same way that the export trade is concentrated in a few such mills in Scandinavian countries; so prospective buyers need have no fears concerning the standard of product that will be offered.

NEPAL

• Paper production in Nepal consists entirely of handmade coarse paper. The Nepalese Government, however, has launched an industrial development program covering three 5-year periods, which provides for the building of a pulp and paper mill during the first period and additional paper mills during the second and third periods.

NEW ZEALAND

• A survey of the probable trend in demand and supply as far ahead as 1975 indicates that the prospective surplus of raw forest material in New Zealand over

SURINAM

• The Dutch company Bruynzeel of Amsterdam, which has large wood manufacturing plants in Indonesia and South Africa as well as a factory in Amsterdam, has just completed the construction of a modern combined sawmill and plywood factory in Surinam. The buildings

are located on the riverbank, close to the city of Paramaribo. The sawmill uses about 150 m^3 (r) per day, of which 40 percent is turned out as finished products, mostly flooring, to be used locally in Surinam and other Caribbean countries. The plywood factory, equipped with American machinery, consumes about 150 m^3 (r) a day, out of which is produced approximately 45 m^3 plywood, 4.5 mm. thickness. The product, is used for furniture, doors, cabinets, etc., and is mostly exported to Holland, Curacao, and the Caribbean area. The timber used is *Virola surinamensis* (Baboon or Banak), formerly considered to be of rather low value. The company obtains its supply mostly from Surinam, but some timber is also bought in French Guiana.

Union of Soviet Socialist Republics

• In 1949 a new schedule of stumpage prices is to be put into effect throughout the U.S.S.R., to be adhered to by all Government agencies and collective farms engaged in timber cutting. This new price list takes into consideration a number of factors:

1. The place where the timber is cut. For determining stumpage prices the country is divided into six zones or regions. These zones are largely geographic, but not entirely. The forests in the prairie areas constitute, for instance, one zone and the forests of Caucasus and Crimea another; the forests of Western Siberia, Eastern Siberia, and the Far East are all combined in still another zone. On the other hand, forests reserved for some special purpose, like watershed protection or health and recreation, or forests which contain a surplus of old timber or which for economic reasons can now be exploited only partially form separate zones irrespective of their geographic location. There is thus an overlapping of zones.

2. The distance from the place where the timber is cut to points on the main lines of transportation or to local sawmills. Seven such divisions, based on the hauling distance, are recognized: (a) from 0 to 4 km; (b) 4.1 to 10 km; (c) 10.1 to 20 km; (d) 20.1 to 30 km; (e) 30 to 40 km; (f) 40 to 50 km; and (g) over 50 km.

3. Dimensions and the character of the product cut. Four kinds of products are distinguished: (a) Large sawlog timber (25 cm and over in diameter); (b) Medium-sized logs (13 to 24 cm thick); (c) Small-sized logs (3 to 12 cm in diameter); and (d) Cordwood.

4. The species from which the product is cut. Species are divided into four groups: (a) conifers; (b) birch; (c) aspen and other soft, broadleaf species; and (d) oak and other hardwood species.

A concrete example for one zone only may be used in illustration. In Zone V, in which a great deal of the logging is centered, the stumpage prices run as follows in rubles per cubic meter: For large spruce sawlogs within a hauling distance of from 0 to 4 km—26 rubles; within a hauling distance of from 4.1 to 10 km — 16 rubles; within a hauling distance of from 10.1 to 20 km — 4 rubles.

For medium-sized spruce logs the stumpage prices within the three stated hauling distances are 18, 11, and 2.8 rubles; for small spruce logs, 9, 5.5, and 1.4 rubles; for cordwood, 4, 2.2, and 0.6 rubles. Birch timber commands almost the same stumpage prices as the conifers.

Oak and other hardwoods under comparable conditions are rated generally twice as high as the conifers, although the stumpage price for birch and maple run 15 and 10 percent lower than that for oak.

• In spite of herculean efforts, the forest industry in the U.S.S.R. is still experiencing great difficulties of readjustment to the new conditions that arose as a consequence of the Revolution and the two world wars. Nevertheless, the planned output for 1950, namely 280 million m^3 of roundwood, is 20 percent larger than the cut in 1940. To understand the difficulties confronting the industry, one need only keep in mind the following facts:

1. Growth of Domestic Needs

The rapid industrialization of the country is making an increasingly greater domestic demand upon the products of the forests. Restoration of the war-devastated regions is also adding heavily to demand upon lumber and other forest products needed in reconstructing the 2,240,000 houses destroyed during hostilities.

2. Unequal Distribution of Forest Resources

The Ukraine and most of southwestern European Russia, though the most densely populated and industrially developed region in the Soviet Union, is rather poorly timbered. Its lumber consumption, therefore, has been far in excess of its own resources and consequently its forests have been overcut. Yet most of the 6,500 saw-frames, with an annual output capacity of some 80 million m^3, were in the past located in the western part of European Russia. Even up to about 1937 most of the timber-cutting was still largely concentrated in the basins of the Volga, Don, and Dnieper, with their tributaries, and in the upper reaches of the Western Dvina, comprising in all a territory of approximately 54 million hectares, or only 10 percent of the total forest area of the country. Large quantities of timber, lumber, and even firewood had to be brought into the region, much of it by rail, from far away. On the other hand, northwestern European Russia (Vologda and Archangel Provinces) has vast forests, and the region was for a long time a great timber-producing center. The products of these forests, however, were destined not to meet domestic needs, but to maintain a large timber-export trade in which Russia for many years occupied a foremost place. Large quantities of lumber, timber, and other forest products went out by water each year from the ports of Leningrad, Murmansk, and Archangel to England, the Netherlands, Belgium, and other western European countries, while few of these products could conveniently reach the southern part of Russia. At the same time, enormous sparsely populated stretches of virgin forests in northern European Russia, in the Urals, and especially in the basins of the Yenisei, Ob, and Angara rivers in Asia were barely opened for exploitation. The movement toward the north, western and eastern Siberia, and the Far East began in the late 1920's, and in the four years between 1929 and 1932 the volume of timber cut in new regions doubled.

3. Shifting of the Center of the Lumber Industry from the West toward the North and East

The need for such a shift had already been realized in the 1920's. The plants were for the most part old and inefficient, and they lacked raw materials near at hand. The war has hastened this process. Many of the plants were destroyed by the enemy, while others were picked up bodily and transferred hurriedly to the East before the advancing armies. During the last two decades the efforts of the Government have been directed toward tapping the resources of the hitherto poorly developed territories. This has meant building new railroads connecting the large rivers with canals to transport the large stocks of mature timber from the North and East to the timber-hungry South. One of the first steps was to connect by railroad and canal the ports on the North Sea with Leningrad, and the latter with the Volga River and Moscow by means of the Volga-Moscow Canal. Three new railroads covering a total distance of 2,300 km were completed in the far north during 1937-42. These run from east to west over a difficult terrain and frozen tundra, and connect with the main railroads running south from Archangel and Murmansk. As a result of these new transport facilities, the output of the sawmills located in Archangel, which in the past was shipped almost entirely abroad, could now be diverted for domestic use in southern and central Russia. The timber export from the Leningrad, Archangel, and Murmansk ports has therefore now been greatly reduced, and the character of the exports is also changing.

The new five-year plan calls for the construction of an additional 3,600 km of railroads through the forested regions of northern European Russia and the same number in Siberia, demanding the production of 185 million railroad ties. Several deep canals connecting the main rivers are to be dug also. Some of these have already been completed; others are in construction and will be completed in the next few years; still others are only in the blue-print stage. These canals will link the Volga with the Dnieper through the Oka and Desna Rivers; the Volga with the Pechora and the Vichegda through the Kama; the Volga with the Ob through the Chusevaya and the Iset; the Volga with the Don; the Volga with the Northern Dvina; and the Western Dvina with the Dnieper. Such a network of canals and railroads will enable all parts of central and southern European Russia, the Ukraine, the Donetz coal region, the North Caucasus, and the Trans-Caucasus to receive the needed supplies of wood from Carelia and the upper reaches of the Kama, Volga, and Viatka basins.

Similar developments are taking place in the Urals and in Asiatic Russia, especially in the basins of the Yenisei and Ob, flowing through the center of the enormous Siberian forests. A great deal of logging is being done along the banks of the rivers. Huge rafts containing 30,000 m^3 of logs are towed south up the rivers to Krasnoyarsk, Maklakovo, Novosibirsk, Barnaul, and many other indus-

trial centers of Siberia. At Igarka near the mouth of the Yenisei, large sawmills have been built, rivaling those of Archangel. Igarka is accessible to sea-going boats and may eventually become a large timber-exporting port for western Europe by the still somewhat uncertain Great Arctic sea route. Great stress is laid on building some 20 new pulp and paper plants in the near future. The pulp and paper industry before the war centered largely in the West and in the Carelian and Leningrad regions—the main battleground—and as a consequence was greatly crippled. The first large pulp and paper plant in the Far East was erected in 1942 at Komsomolsk on the River Amour. In western Siberia one paper mill was built in 1936 at Barnaul on the River Ob, and another in 1937 at Krasnoyarsk on the Yenisei River.

4. Shortage of Labor

Shortage of labor, especially of skilled labor, is plaguing the industry, particularly because mechanization of logging is being pushed very fast. The pages of the official timber trade organ of the Ministry of Forestry (Lesnaya Promyshlennost) are full of complaints from different regions that labor efficiency is below the normal (only 80 percent), that out of thousands of available power saws only a few hundred are being used, and also that out of thousands of tractors only a few hundred are in operation. The still inadequate housing facilities and other hardships that go with living in a remote undeveloped country tend further to lower the workers' productivity. The low labor efficiency makes it necessary to engage more workers in the lumber industry than would otherwise be justified.

All these difficulties may be taken as manifestations of the growing pains of an industry which tries to shake off the great destruction and dislocation wrought by the war, and to create in remote, undeveloped territories a new industrial base capable of meeting all the needs of a vast and expanding country. Its great potentialities, inherent in the enormous forest wealth of the country, cannot come to full fruition, however, until the pressing problems of transport and labor have been successfully resolved.

Policy, Legislation and Administration

FINLAND

• The Government of Finland has appointed a committee to prepare an overall plan for dealing with the most immediate problems in the promotion of the country's forest economy and forest production. Professor Yrjö Ilvessalo, member of the Academy of Finland, has been appointed chairman of the committee, in which the private forest owners, the Government's forest economists, the woodworking industries, and other bodies connected with forestry are represented.

IRELAND

• An interesting article dealing with the present trends in forest policy in Ireland has recently been published in the Irish Forestry Review.

After pointing out that Ireland's consumption figures are lower than normal and that social or industrial progress naturally presupposes an increase in this figure, the author recalls an official report printed in 1908 which estimated that 405,000 to 486,000 hectares (1 million to 1,200,000 acres) of forested areas were needed in Ireland to supply a consumption rate of 0.3 m^3 (r) (10 cubic feet) per person, which is rather a low consumption figure.

The figure of 240,000 hectares (600,000 acres) which is the aim for the actual forestry program — some authorities would even reduce it to 160,000 hectares (400,000 acres) — is considered insufficient by the author. The progress made since 1908, he believes, is insignificant when one considers that 40,000 hectares (100,000 acres) have been planted in 40 years and that an equal surface has probably been exploited and not reforested. He points out the need for a bolder policy on the use of marginal lands that are not suitable for cultivation or have very slight value as common grazing lands. In the past, these lands, which would have been suitable for forestry, have been sold or parceled out among small land owners who are unable to assure their proper use and very often let them deteriorate. The necessary labor for plantation and forestry work is difficult to find in these regions, where depopulation is increasing.

These lands can be reclaimed, but the author warns against a policy of purchasing only cheap land; since this land has deteriorated, fast-growing plantations cannot be successful on it. The plantation of exotic stands, sitka, Japanese larch, tsugas, and other species, however, has given very good results. The average annual growth reaches 18 m^3 per hectare (250 cubic feet per acre), while plantations of Scots Pine, which are considered as being poor, produce 2.1 m^3 per hectare (30 cubic feet per acre). Under these conditions, the author deplores the fact that this species was planted at a rate of 50 percent in the past.

Finally, he estimates that the rhythm of reforestation which has been set is much too slow when one considers that the industry tends to use small timbers. The actual planting of 4,000 hectares (10,000 acres) should be accelerated to 8,000 or 12,000 hectares (20 or 30,000 acres); if the reforestation is composed of adequate species, it could produce in 20 years an appreciable quantity of raw material for industries such as pulp, fiberboard, and woodwool.

Even if the views expressed here can be considered as controversial, it is hoped that such articles will draw attention to the seriousness of forestry problems, which are a world-wide concern.

UNITED STATES OF AMERICA

• The growing interest of bankers in opportunities for financing proper silvicultural practices is shown by the 1949 program endorsed by the American Bankers Association. The program will include: (1) Acquainting bankers with information concerning all forestry agencies operating in the United States; (2) co-operation between the federal, state, and private forestry agencies and the bankers in studying forestry and its financial opportunities in the individual state and making use of studies made by the Federal Reserve banks and others; (3) co-operation with colleges of agriculture in making studies of production from well managed farm woodlands; (4) a study of integrating bank financing with forestry protection; and (5) a study of adequate fire control

Meetings

• The Fifth Session of the Annual Conference will be held at Washington, the temporary headquarters of FAO, starting 21 November 1949. The FAO Council, at its recent meeting in Paris, France, was unable to recommend acceptance of the offer of the Cuban Government to have the Conference in Havana, in view of the added burden to the already strained budget of the Organization which this location would have involved.

Reviews

The Coming Age of Wood. Egon Glesinger. Pp. 279, illus. Simon & Schuster, New York. 1949. $3.50.

Dr. Glesinger's latest book, written before he joined the staff of FAO, has received wide notice in the press. We reprint below, by kind permission, extracts from an impartial review which appeared in *The Scientific Monthly*, a periodical published by the American Association for the Advancement of Science. Although directed to a United States public, the review should be of interest to all our readers.

"'Wood,' asserts Dr. Glesinger, 'will become the characteristic raw material of our civilization because it has three attributes which make it unique among all raw materials.' It is universal. It is abundant. And it is inexhaustible.

"He should know. Forests and their products have not had a more eloquent and enthusiastic champion in our time than Egon Glesinger. Now chief of the Forest Products Branch of the Food and Agriculture Organization, he came to the United States in 1941, having been forced by the Nazis to leave Europe, where since 1933 he had served as secretary-general of the International Timber Committee, originally sponsored by the League of Nations. Although a keen student of

modern wood technology, his conception of the possible contributions of wood in all its physical and chemical aspects to man's welfare is that of an economist.

"Fairfield Osborn's *Our Plundered Planet* and William Vogt's *Road to Survival* have conditioned us to think of land and resources from a global viewpoint. Glesinger's book beautifully supplements these splendid works by directing our attention to a particular kind of land and a particular kind of resource. Forests cover about 8,000 million acres, one fourth of the land surface of the earth. Although not all the world's forest resources are usable in a commercial sense, still only a fraction is utilized even after centuries of exploitation.

"That wood as a raw material has satisfied many human requirements since earliest antiquity is a fact which it were almost platitudinous to repeat. But that wood as a raw material is capable of satisfying almost every requirement of existence is one of Glesinger's statements that will doubtless inspire some disbelief. But no scientist, or intelligent layman for that matter, should challenge the author's assertion without reading him and thus giving him an opportunity to prove his thesis.

"We have long known that wood supplies shelter and fuel, that it produces food for men and animals. It is the world's second most important source of textile fibers. It is capable of supplying enormous quantities of motor fuels and lubricants. From wood come plywoods, plastics, paper products whose number is legion, and chemicals whose diversity and possible application are almost beyond our calculation.

"Tree extraction, says Glesinger, though practiced since the dawn of history, is still in its infancy. Yet of all the processes of forest chemistry, none is more suited to the nature of the growing tree than the extraction of the substances trees produce as living organisms. If all the extracts from all the world's trees were captured, they would add untold variety, color, and wealth to the arsenal of chemicals upon which mankind must be able to draw to achieve higher standards and well-being.

"The shocking waste of wood, both in logging and in manufacture, by American forest products industries is an extravagance about which the author, with his European background of conservative utilization, is understandably critical. He makes a convincing case for integration of industry to end unreasonable competition for resources and to obtain closer utilization of raw material, including so-called waste products. He insists that in the interest of more equitable distribution of the wealth derivable from mass production of our forest resources for the benefit of all people, industry must rely more on technology and less on cutthroat competition. To obtain the complete utilization he deems necessary would require such radical reorganization of the forest industries as may be wholly impracticable in this era of still fairly abundant, though declining, resources. Still, he is able to show examples of such integration, not only in Scandinavia under the impact of economic and technologic development and in the Soviet Union under political five-year plans, but in the United States as well, where several large, financially secure, and family-dominated concerns have successfully integrated their production and forest-management operations. In short, it can happen here because it is happening.

"That forest destruction is manifestly against the public interest is a demonstrable fact, and it has been studied, and inveighed against, by the forestry profession for more than half a century. The solution of this problem, as Glesinger sees it, is public, that is to say Federal, regulation of private forest management by law. In this proposal he echoes the efforts and agitation of a long line of public officials, beginning with Gifford Pinchot and including Franklin D. Roosevelt, the last three chiefs of the U. S. Forest Service, and, most recently, President Truman. ...

"This book is worthy of the earnest attention of every American who may have the least interest in the role which modern technology applied to forest resources may play in increasing industrial prosperity and human comfort."—HENRY CLEPPER, Society of American Foresters, Washington, D. C.

The Great Forest. Richard G. Lilliard. Pp. xxiv + 399, illustrated. Alfred A. Knopf, New York, 1947. $5.00.

The Great Forest is an ambitious undertaking into which a vast amount of faithful research has gone. Compressed into a single volume is the story of the American forests over a period of more than three centuries — the story of how the original forests served the nation, how in turn they were treated, and what has been done toward replacing a ruthless policy of exploitation by a policy of conservation. In selecting his material and in weaving the threads into a fabric, the author has shown discrimination and imaginative understanding of his subject. The book is interesting and readable.

The first European colonists found America a land of trees, and of fat soil underneath; of unbelievable wealth in game, fish and plants; of unlimited room for a new and richer life. The backwoods system developed out of necessity; people learned to live in and from the forest. They invented implements for clearing the forest and using its products; they devised guns and hunting methods; and they learned the art of guerrilla warfare. The traits of resolution, stamina, ingenuity and adaptability developed in the colonists and their leaders by pioneer life significantly influenced the political future of the land and paved the way for expansion of the new nation into the great agricultural regions of the mid-continent. The backwoods men, women, and children accepted a hard and dangerous life as the price for realization of the American dream.

In Colonial times the mother country looked eagerly to the great American forest to fill its needs for ship timbers, naval stores, potash, and building timbers, and a lively and varied export developed. But soon the colonists — men of ambition and determination — were no longer willing to be subservient to the wishes and fortunes of English contractors, and independent colonial commerce began to compete in the available markets of the world, naturally to the distaste of the homeland.

Moreover, the colonists resisted the persistent efforts to reserve the best pines as masts for the Royal Navy, and this resistance is placed in perspective as an antecedent of the Revolution.

Wood and other forest products were mainstays in the post-Revolution expansion in commerce, industry, transportation, and settlement of new lands. Rich rewards were gained, but at the cost of tremendous wastage. In the individual search for quick wealth and the community ambition for progress, which had political support, little recognition was paid to the nation's rights in the forests, despite a few scattered official efforts to protect them.

The loosely liberal land laws and their lax or venal administration made it possible for individuals to acquire great baronies of public forest at a trifling cost and to build out of their exploitation great fortunes, fragments of which dribbled back to the public as museums, art galleries, and other baronial memorials.

Moreover, the barons often ruled the life and economy of the countryside. But their excesses in the use of their power built up more and more centers of rebellion, which at first only slowly acquired champions in the Congress and elsewhere. So, too, the increasingly clear results of widespread forest destruction for private gain were attacked by capable leaders, among them Carl Schurz, B. E. Fernow, and, especially, Gifford Pinchot. Finally the challenge to the lumber monopolies and the need for practical forestry became part of Theodore Roosevelt's program to curb monopolies in the public interest. Essentially the fight was won.

To its other sins, the author points out, the lumber industry long added exploitation of its labor. Eventually, early in the twentieth century, the organized protests of labor became effective. The bitter, persistent, often misdirected, sometimes bloody, but gradually victorious fight of labor for fair treatment is well told.

During three centuries the great forest was a powerful factor in building an industrialized and mechanized nation. In the machine age, wood is a vital material. In warfare, it serves a multitude of uses from charcoal in gas masks to wooden ships and to cellulose in high explosives; in peace it is not only used for traditional purposes of construction; the forests are a source of medicines, food, and even clothing; of modified wood in new and varied chemical industries; of wood as pulp, as plywood and as veneer. The need for forests and their products is today greater rather than less than in earlier ages.

There are uncertainties about the future conservation of forests which the author recognizes, but his final conclusion is that: "Though the virgin wilderness is now gone—its mighty forests, wonderful still, will play in the future, as in the past, a major role in fulfilling the original promise of American life."

It is reasonable to observe, however, that much more needs to be done to realize this end.

List of Participants in Conference continued from back cover.

PHILIPPINE REPUBLIC

Delegate:

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SIAM (THAILAND)

Delegate:

MOM CHAO SUBSUEKHSWASTI SUEKHSWASTI, Director-General of the Royal Forestry Department, Bangkok

Associates:

THIEM KOMKRIS, Acting Special Forest Officer and Chief of Forest Control Division, Bangkok
SAMBOON NA THALANG, Divisional Forest Officer, Songkhla

UNITED KINGDOM

(representing the Federation of Malaya, Colony of Singapore, and Colony of British Borneo)

Delegate:

J. P. EDWARDS, Deputy Director of Forestry, Federation of Malaya, Kuala Lumpur

Associate:

J. N. MCKELVIE, United Kingdom Trade Commissioner, New Delhi

Secretary:

R. STONE, Personal Assistant to the United Kingdom Trade Commissioner, New Delhi

OBSERVERS

INDONESIA (REPUBLIC OF)

Chief Observer:

SOEDARSONO, Representative of the Republic of Indonesia in India, New Delhi

Observer:

RUSLAN BABEO, Official of Republic of Indonesia Office in India, New Delhi

KOREA

Chief Observer:

MIN SIM HYUN, Director of National Experiment Station, Seoul

Observer:

PORK BI DUEK, Managing Director, Korean Timber Co., Ltd., Seoul

NEPAL

Chief Observer:

SHER JUNG (LT. COL.), Conservator of Forests, Nepal

Observer:

G. N. RAYAMAJHI, Forest Officer, Nepal

PORTUGAL

Observer:

E. VALLES, Nova Goa

UNESCO

Observer:

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SCAP (JAPAN)

Chief Observer:

H. B. DONALDSON (LT. COL.), Chief, Forestry Division, Natural Resources Section, G.H.Q., SCAP, Tokyo

Observer:

GEN SHIMIZU, Timber Management Specialist, Bureau of Forestry, Ministry of Agriculture and Forestry, Tokyo

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Technical Secretaries:

D. Y. LIN (FAO)
LESLIE VERNELL (FAO)
RADU C. FORTUNESCU (FAO)

Chief Officer in Charge of Arrangements:

M. A. MUTHANNA (Mysore)

Information Officer:

P. V. ACHARYA (FAO)

Administrative Secretary:

MORRIS GREENE (FAO)

Joint Administrative Secretaries:

J. V. A. NEHEMIAH (Govt. of India)
C. A. R. BHADRAN (Govt. of India)

Special Officer in Charge of Local Arrangements:

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K. S. MATHEWS (Govt. of India)

Forestry and Timber Utilization Conference for Asia and the Pacific

LIST OF PARTICIPANTS

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Associates:

U SAN, Conservator of Forests, Sittang Circle, Rangoon
U TUN KYAW, Forest Economist, Rangoon

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Delegate:

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Associates:

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W. R. C. PAUL, Divisional Agricultural Officer, Kandy

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Delegate:

A. P. CHOLLET, Chief Inspector of Waters and Forests, Saigon

Associates:

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G. A. DUVAL, Chief Conservator of Waters and Forests, Kingdom of Cambodia, Phnom-Penh (representing the French Union)
H. DE LIMAIRAC, French Consul, Bombay

INDIA

Delegate:

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NETHERLANDS

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R. SEWANDONO, Inspector of Forestry, Forestry Service, Batavia

Associates:

CH. C. WOLFF VON WULFING, Chief Commercial Division, Forestry Service, Batavia
M. HOEK, Conservator, Chief, Division of Industrial Affairs, Batavia

NEW ZEALAND

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Y. S. AHMAD, Conservator of Forests, East Bengal

Associate:

H. RAHIM, Chief Conservator of Forests, Sind

(Continued on inside back cover.)